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HYPOGLYCÆMIA: A SURVEY AND AN ACCOUNT OF TWENTY-FIVE CASES.[1]

By CLIVE SIPPE, M.B., Ch.M. (Sydney), M.R.C.P. (London),
Honorary Relieving Out-Patient Physician, Brisbane General Hospital,

AND

JOHN BOSTOCK, M.B., B.S. (London), D.P.M., M.R.C.S., L.R.C.P.,
Honorary Neurologist, Brisbane General Hospital.

THE growth of knowledge takes place either as an almost imperceptible rising tide or as oncoming waves, which, by their impact, rapidly erase old landmarks. As an example of the latter may be cited the epoch-making work of Banting and Best, who, by the isolation of insulin, in 1922, not only revolutionized the treatment of *diabetes mellitus* but also created a new interest in sugar metabolism. It is remarkable that whilst the problem of hypoinsulinism has received such world-wide recognition, the opposite condition of hyperinsulinism, and its allied states, has been almost totally neglected. Although sporadic cases have been reported in the literature, no adequate generalization as to frequency and clinical forms has been published.

The present survey is based on twenty-five cases found in our hospital and private practices. Whilst the actual number is not great, it indicates that hypoglycæmia is a relatively common condition in this country.

NORMAL FASTING BLOOD SUGAR.

A certain diversity of opinion exists concerning the normal fasting blood sugar. Phillips[1] quotes Sendrail and Planques as having cited eight authorities who agree that any reading below 0·090% is to be considered a hypoglycæmia. Joslin[2] and Brown[3] state that the average normal fasting level is 0·10%.

[1] Read at a meeting of the Medical Section of the Queensland Branch of the British Medical Association, Brisbane, on November 21, 1932.

Graham[4] considers 0·080% to 0·120% as the normal range. Pribram,[5] however, has investigated three patients with blood sugar of 0·080% to 0·090% who showed clinical signs of hypoglycæmia. Leyton[6] and Langdon Brown[3] have referred to two diabetics who developed symptoms of hypoglycæmia with blood sugars of 0·250% and 0·150% respectively. On the other hand, Banting[7] has stated that hypoglycæmic symptoms may not be noticed until the blood sugar falls to 0·032%.

As in all disease, the susceptibility of the individual varies, so that one person may feel well with a blood sugar which gives rise to acute hypoglycæmic symptoms in another. "We do not know why one man is wretched with 0·08 per cent. sugar in the blood, whilst another develops no symptoms when his blood sugar is 0·06 per cent." (Leyton.)

It appears that any reading below 0·090% in the presence of typical symptoms, must be regarded with suspicion.

INCIDENCE.

Frequency.

In a large series of cases met with in general medical practice, the percentage of cases of hypoglycæmia was 0·47 and that of diabetes 0·51. Thus it will be seen that hypoglycæmia is practically as common as hyperglycæmia. The figures for the former would probably have been higher had the physicians concerned been as familiar with the syndrome during the whole period in which the cases of hyperglycæmia were recorded as they have been during the past twelve months.

The states of lassitude and inability to combat the constant strain of modern life, found in so many morbid conditions, may, in many cases, be due to an associated chronic hypoglycæmia.

Age.

There does not appear to be any definite age factor, except in regard to the type of symptoms. Cyclical vomiting and acidosis are more common in childhood, whereas the definite manifestations of hypoglycæmia occur more frequently in adult life. Most of the individuals who develop hypoglycæmia have suffered from acidosis or cyclical vomiting in childhood.

Sex.

Most of the reported cases, with the exception of those due to pathological defects of the pancreas, have occurred in females. In our series of twenty-five patients, twenty-one were female and four male.

ÆTIOLOGY.

Harris,[9] in America in 1924, was the first to describe a clinical syndrome caused by hypoglycæmia, though no insulin had been administered. He reasoned that because, with disorders of thyreoid function, both hypothyreoid and hyperthyreoid states existed, similar conditions should occur with insulin dysfunction. He referred to diabetes as a condition of hypoinsulinism, and postulated a clinical syndrome due to hyperinsulinism. Following up this, he described three typical cases of hypoglycæmia, with fasting blood sugar ranging from 0·056% to 0·067%, due, in his opinion, to hyperinsulinism. These patients were relieved of their symptoms by frequent feedings. With other organs, hypertrophy and hyperactivity may be followed by degeneration, atrophy and loss of function, so that it seems probable that a condition of hypoinsulinism or diabetes may follow prolonged excessive work of the islands of Langerhans.

In a masterly article, Cammidge[9] reviewed the subject of chronic hypoglycæmia. Experimental evidence was produced to show that a low blood sugar, 0·060% or less, occasionally met with in healthy animals, was a recessive character transmitted in accordance with Mendel's law of heredity. Breeding experiments were difficult to carry out with hypoglycæmic mice, as pregnancy and parturition were remarkably fatal, and a considerable number of the progeny of those which survived were born dead, or died shortly after birth. From a study of our cases, it appears that the hypoglycæmic entity possesses a definite hereditary tendency. A family history of acidosis, cyclical vomiting, migraine, or some obvious manifestations of hypoglycæmia, can very frequently be found.

Cammidge stated that lack of exercise, high protein diet, and a hot climate, all tended towards the production of chronic hypoglycæmia. Most Australians consume more than the average amount of meat, and this, combined with the limitation of exercise during the hot summer, probably accounts for the apparent greater frequency of the condition here, and also for the exacerbation of symptoms during the hot months.

Severe exertion in an individual with a normal blood sugar may lead to a state of acute hypoglycæmia, with its attendant train of symptoms. After a marathon race in Boston, blood sugar estimations were performed on the participants, and it was found that the sugar level had a very definite relationship to the physical condition of the individual.[10] Those who finished in good condition had normal blood sugar, whereas as the degree of collapse increased, so the blood sugar became lower. Runners in a state of collapse had a sugar content as low as 0·040%. An interesting sidelight on this question has been in the training of the Cambridge rowing crew during the last few years. We have been informed that these men have, during their training, always eaten a large quantity of glucose and sweets, whereas the Oxford crew have confined themselves mainly to protein foods. The Cambridge crew have, for the last few years, nearly always been victorious, and probably the dietetic measures adopted during training have been an important factor in increasing the staying power of the individuals.

The causes of chronic hypoglycæmia can, in our opinion, be grouped under six main headings. A study of the ensuing diagram will illustrate this point.

Each ætiological factor will now be considered in detail.

The Pancreas.

Harris was the first to draw attention to the fact that insulin, the internal secretion of the pancreas, is the factor concerned. Hypoinsulinism, by

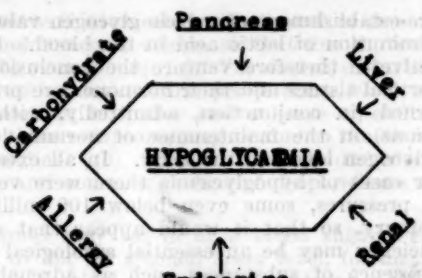

DIAGRAM I.

insufficient utilization of carbohydrates, produces the hyperglycæmia of *diabetes mellitus*, whereas hyperinsulinism, by over utilization, leads to hypoglycæmia. Mansfield[11] has produced hypoglycæmia in dogs by mass ligation of the body of the pancreas which obstructs the ducts, but preserves the blood supply of the distal part of the organ. He attributed the hypoglycæmia following operation to the overproduction of insulin by the hypertrophied islets of Langerhans. Herscheimer[12] ligated the pancreatic duct in birds, and found that after operation the gland contained five times as much insulin as the normal. Terbruggen and Heinlein[13] produced a lethal hypoglycæmia in rabbits by irradiation of the pancreas. In the secretory portion of the organ degeneration was noted, whereas the islands of Langerhans were well preserved or even hypertrophic. Phillips[1] reported a case of uræmia in which the blood sugar was as low as 0·025% shortly before death, in contradistinction to the usual increase. At autopsy, in addition to the glomerular nephritis, definite hypertrophy of the islands of Langerhans was discovered. John[14] reported the case of a diabetic who for some months had a normal blood sugar with a very liberal diet, and who finally died. The blood sugar when the patient was in coma a few hours before death was 0·030%. At autopsy there was marked hypertrophy of the islands of Langerhans.

Several cases of hypoglycæmia due to pancreatic new growths,[15] [16] [17] [18] [19] including three cases of cure following operation, have been reported. Most authors regard hyperinsulinism as a common cause of hypoglycæmia. The Finneys,[20] in 1928, believing the cause in a case of theirs to be hyperinsulinism, removed a portion of a normal pancreas, with no alteration in symptoms and very little change in the blood sugar levels. The lowest readings before operation ranged from 0·041% to 0·080%, and after operation, from 0·045% to 0·070%. An interesting point about this case was that at times the fasting sugar was as high as 0·220%. There is no doubt that hyperinsulinism is a factor in most cases. This is not always actual, due to overproduction; but frequently relative, due to a decrease in antagonistic substances such as pituitrin and adrenalin.

The Carbohydrate Factor.

The carbohydrate factor can be divided into three groups: (i) low intake; (ii) poor assimilation; (iii) excessive use.

According to Harris, starvation *per se* does not cause hypoglycæmia. He found that in several patients with pyloric or œsophageal obstruction who were practically starved the blood sugars were within normal limits. However, several of our patients had very poor appetites, so that the total food intake was low, and when this was altered, the clinical condition improved rapidly. Hence the deficient carbohydrate intake must have been a factor. Furthermore, the diet of other patients was rich in protein and fat, especially butter, and relatively poor in carbohydrate. Clinical improvement followed better adjustment of the diet.

The ability to absorb and utilize complex carbohydrates is deficient in some individuals, since the administration of a simple sugar, for instance, glucose, resulted in improvement, whereas increasing the proportion of complex carbohydrate had failed to do so.

Previous mention has been made of the hypoglycæmic state occurring in athletes after a marathon race. Another fairly common cause appears to be excessive loss of lactose during lactation,[21] of which the following case is an example.

CASE I.—The patient, a female aged thirty-one years, always felt tired and breathless on exertion. She complained of sick feelings, and had to "flop down" if she exerted herself. At times she felt as if she was going to die. The glucose tolerance test gave the following results:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·090	0·104	0·117	0·123	0·062

She reacted well to barley sugar, but persisted in suckling the child.

The Liver and Muscular Dystrophies.

Liver or muscle damage leads to deficient storage and poor glycogen reserve. Complete removal of the liver, according to a technique advised by Mann,[22] in America, results in death within a few hours, preceded by symptoms definitely of a hypoglycæmic nature. The animal can be revived from coma and kept alive for forty-six hours by continuous administration of glucose, till death finally occurs, apparently from accumulation of nitrogenous products in the blood, although the blood sugar remains at a high level. This seems to prove "that the well-being of an organism is definitely influenced by the presence of a certain quantity of glucose in the blood, and that when this quantity diminishes, the organism is seriously affected". (C. H. Mayo.)

Cammidge stated that experiments with animals poisoned by hydrazine phosphate have suggested that the administration of glucose in limited amounts enables the defective liver cells to carry out their functions more efficiently. Hence, patients having a damaged liver or suspected of having such damage, should have a diet rich in carbohydrates and low in protein.[23] Pribram quoted a case of hypoglycæmia due to a liver considerably damaged by alcohol.

Baumhauer[24] states that a lowered sugar content of the blood occurs with parenchymatous changes in the liver, caused by chloroform, by arsphenamine, by the fungus *Agaricus bulbosus*, by phosphorus, by cancer and by hydrazine.

Cantarow and Gehret[25] have quoted a patient suffering from biliary tract disease, with a fasting blood sugar of 0·070%, in whom there was no appreciable rise of the sugar level during ether anæsthesia. This patient died eighteen hours after operation with extensive necrosis of the liver, and the absence of normal ether hyperglycæmia is shown to be an indication of poor glycogen storage in the liver. The authors state that it is essential, so far as is possible, to insure an adequate hepatic glycogen content before operation on patients with biliary tract disease. Scholl and Steiner[26] treated six patients suffering from subacute yellow atrophy of the liver following prolonged arsphenamine medication, by a diet rich in carbohydrates, together with 30 to 60 grammes of lævulose daily. All patients showed considerable improvement, or were completely cured.

According to Planques,[27] McCrudden and Sargent,[28] in the muscular dystrophies there is a lowered blood sugar. One case investigated by us showed a normal sugar tolerance.

The Endocrine Factor.

The activities of the various endocrine glands are interdependent the one upon the other, so that this factor becomes extremely complex. However, cases do occur when the effect of a particular gland predominates. Pribram[6] quoted three cases of chronic glycopenia due, in his opinion, to endocrine disturbances without attaching the blame to any particular organ.

Cammidge, in his article, states that abnormal calcium metabolism, usually hypocalcæmia, is bound up with the occurrence of hypoglycæmia. In these cases the indications point to a disturbance of parathyreoid function.

Minot and Cutler[29] state that a frequent accompaniment of hyper-guanidinæmia in intoxicated animals was a severe hypoglycæmia. In five cases of severe gastro-intestinal disturbances in infants, Dodds discovered a low blood sugar associated with a hyperguanidinæmia up to twice the normal level. Associated with an increased guanidine content of the blood there is a hypocalcæmia; both these states exist in severe parathyreoid disorders. The intramuscular administration and the intravenous administration of calcium by injection was a definite factor in restoring Dodds's patients to normal.

Many patients have a low blood pressure, and it has been suggested that the weakness of Addison's disease is, in part at least, due to hypoglycæmia.

Britton[30] has shown that the suprarenals probably have a very important relationship to carbohydrate metabolism. Administration of cortico-suprarenal extract brings about recovery of animals which are in the terminal stages of insufficiency, apparently through initial restoration of normal carbohydrate values. Increments in circulating sugar to the normal or even to hyperglycæmic levels occur early after injection of the extract, and are invariably associated with the disappearance of symptoms of insufficiency. There are also correlated and striking increases in liver glycogen. Restoration is completed with re-establishment of muscle glycogen values and the diminution of lactic acid in the blood. Britton and Silvette therefore venture the conclusion that the cortical tissues and their hormones are primarily concerned (in conjunction, admittedly, with other secretions) in the maintenance of normal dextrose and glycogen levels in the body. In all except one of our cases of hypoglycæmia there were very low blood pressures, some even below 100 millimetres of mercury, so that it would appear that adrenal insufficiency may be an essential ætiological factor. The absence of substances such as adrenalin and pituitary hormone, which are antagonistic to insulin, permits the occurrence of a relative hyperinsulinism.

In myxœdema and the later stages of acromegaly the sugar tolerance curve is lower than normal. The nervous system controls to some extent the internal secretions, so that nervous influences play a definite part in the determination of the blood sugar level.

The Renal Factor.

Cases of so-called renal glycosuria in which glycosuria occurs with a normal or subnormal blood sugar are now recognized as being due to a lowered renal threshold. The dangers of indiscriminate use of insulin in cases of glycosuria without first determining the level of the blood sugar are well known. Cammidge drew attention to these, and remarked that he remembered a patient who died owing to large doses of insulin being given in a vain attempt to abolish the glycosuria.

The following patient gave a similar history.

CASE II, a female aged twenty-six years, complained of headache recurring every three or four weeks, present on waking and usually relieved by food. Sugar had been discovered in the urine, and a diet low in carbohydrates had been prescribed on the supposition that the condition was diabetic. The symptoms were greatly accentuated. The blood sugar was 0·068%. After the administration of glucose and barley sugar the symptoms were completely relieved.

When sugar is leaking through the kidneys with a normal or subnormal blood sugar, an excessive loss to the system occurs, and unless adequate carbohydrate is taken to replace this loss, symptoms due to deficient glucose supply to the tissues will take place. This is the simplest form of hypoglycæmia. According to Cammidge, these cases are often due to a hypocalcæmia, and after the correction of this latter condition, the blood sugar returns to normal, and the glycosuria disappears. Probably the hypocalcæmia is due to defective action of the parathyreoids, so that these are really cases of primary endocrine dysfunction. Insufficient vitamin *D* may also be a factor in some of these cases.

The Allergic Factor.

Allergic states are sometimes accompanied by hypoglycæmia.

Symptoms.

The symptoms of the acute attack are those produced by an overdose of insulin.[31] The sequence of events in insulin hypoglycæmia is as follows: (*a*) A feeling of extreme hunger, and a great sense of fatigue develops, so that walking becomes difficult. The patient may become anxious, worried or excitable,

or may act as if intoxicated with alcohol, or demented. (*b*) Tremulousness develops, so that fine movements cannot be carried out. (*c*) Vasomotor disturbances occur, flushing and profuse perspiration which soaks the bedclothes, or pallor and a sense of chilliness. Some of these symptoms may be due to the secretion of adrenaline. (*d*) Finally, mental disturbances, delirium and coma, with loss of deep reflexes, take place.

Symptoms may set in at a blood sugar level of 0·075% or not till a much lower level, for instance, 0·032% is reached. In chronic diabetes with high blood sugar, symptoms may occur when the hyperglycæmia is suddenly lowered, for example, to 0·150%.

Cammidge summed the symptoms up in the following words:

> In simple, mild cases of chronic hypoglycæmia the symptoms are generally limited to a feeling of persistent weariness and the development of unusual fatigue on comparatively mild exertion, particularly when food has not been taken for some time, so that a habit of feeding between meals is contracted. Mental and nervous phenomena are met with in some cases, the most common being defective power to concentrate, and inability to pick up a lost thread of thought; while morning headache relieved by food and improving later in the day is not infrequent. In the severe forms, complicated by the effects of hepatic and glandular disturbances, a sense of tremulousness is often complained of, and incoordination of movement may develop, occasionally becoming so pronounced as to simulate the effects of alcoholic intoxication; epileptiform convulsions may also occur.

Vertigo on sudden movement is a symptom in some instances, and may lead to a diagnosis of Ménière's disease if there happens to be unilateral or bilateral deafness as well. Recurrent attacks of migraine or vomiting are commonly associated with hypoglycæmia, the latter being more frequently met with in children, and the former in adults. Frequently there is a feeling of impending dissolution.

A study of our cases shows that nervous phenomena of a type characterized by a tendency to emotional depression, habitude, reclusiveness, morbid introspection, and feelings of inferiority are frequently present. We regard this, not as a primary neurosis, but as a secondary development of chronic invalidism. Adler has drawn attention to the importance of organ inferiorities. A state of persistent generalized ill health must inevitably fall into this category. From the therapeutic point of view it is essential to diagnose and treat the primary lesion. It is useless to murmur psychological platitutes on re-educative, persuasive and suggestive lines unless the physiological basis be first attacked. Psychology is all-important as a therapeutic measure, but its use is infinitely easier and more efficacious if accompanied by a technique which produces a physical and physiological euphoria. There appears to be no doubt that a sense of well-being is to some extent dependent upon the sugar metabolism. As an example of a definite psychological state may be cited that of Case III.

> CASE III.—The patient had a fasting blood sugar of 0·068%. The growth of a crippling insomnia in adult life could be traced to hypoglycæmic attacks in childhood. The child grew up expecting, and feeling, that with nightfall death was imminent. She was literally afraid to go to sleep, and tried to keep awake. The recognition of the condition and treatment by barley sugar in childhood would undoubtedly have averted a life of chronic invalidism. Psychological treatment over a long period had failed to give relief, but the addition of glucose made a marked improvement.

Cases X, XII, XIV and XVII also illustrate the development of a neurosis dependent upon the hypoglycæmia.

The Finneys considered the hypoglycæmia in their case to be secondary to a psychosis, although the attacks were always accompanied by a low blood sugar and were relieved by glucose or food. Our experience tends to show the reverse to be the case, that is, the psychosis is dependent on the disturbed sugar metabolism and in many cases the correction of the sugar level results in relief of the former condition.

The attacks usually come on some time after a meal; but Labbé, Boulin and Petresco,[32] in France, have described an entirely different type, in which symptoms are produced by the ingestion of food. In these individuals the normal rise in the glucose tolerance curve is preceded by a state of hypoglycæmia. The fall in the blood sugar takes place within the first five to fifteen minutes after administration of the glucose, and is only of short duration, the curve resuming its normal rise within half an hour.

In one case recorded in full, the fasting sugar was 0·115% on one occasion; and 0·112% on another. On the first occasion, fifteen minutes after taking 50 grammes of glucose, the level was 0·046%, and the second 0·038%. On both occasions there was a return of all the symptoms complained of by the patient, which disappeared within a few minutes as the sugar level became normal. In the opinion of the authors, this phenomenon is due to a reflex secretion of insulin caused by the ingestion of glucose.

NOMENCLATURE AND CLASSIFICATION.

The term "acute spontaneous hypoglycæmia" used by some authors is misleading, in that the acute attacks are frequently exacerbations of a state of chronic hypoglycæmia, and therefore not truly spontaneous. The term also suggests that there is no ætiological factor. The word "dysinsulinism" has also been suggested, but is certainly not applicable to all. Chronic glycopenia only describes those cases in which there is a low, but not really subnormal, sugar level.

In our opinion a logical way in which to regard the problem is to speak of a generic condition called hypoglycæmia, which can be divided into two main groups, true and relative. The former is divisible into three sub-groups: the fulminating, the chronic and the symptomless. The latter main type comprises the two sub-groups—cyclical vomiting of childhood, and simple types in which a relatively normal blood sugar is insufficient for the requirements of the individual. The above sub-types may be classified as follows, on a basis of symptomatology.

A. *True Hypoglycæmia.*

1. Fulminating Types: (*a*) Confusional or comatose, (*b*) epileptiform, (*c*) abdominal, (*d*) migrainous, (*e*) asthmatic, (*f*) vertiginous, (*g*) cardiac.

2. Chronic: (*a*) With acute exacerbations, (*b*) without acute exacerbations.
3. Symptomless.

B. *Relative Hypoglycæmia.*

1. Simple.
2. Associated with incomplete fat metabolism.

TRUE HYPOGLYCÆMIA.

Fulminating Types.

The Confusional or Comatose Type.

Several cases of true hypoglycæmia, of fulminating type (*a*), confusional or comatose, have been reported in the literature, and the following cases occurred in our series: VIII, XV, XVI, XVII, XVIII, XIX, XX, XXI, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, XXXVIII.

CASE IV.—The patient was a female aged thirty-five years. Following a very busy and active day at a picnic she went to bed without tea. At 2 a.m. she woke up and felt as if death impended. The jaw fell, and there was no power of suction in the palate. There was loss of power in the arms, loss of consciousness of the legs and a feeling as if death impended. This attack lasted two hours; then severe vomiting occurred, unaccompanied by nausea. There was no pain, only a tight feeling around the abdomen. Following this she felt tired and weak for about ten days, then gradually recovered. Since, there have been recurrent vomiting attacks lasting about four days, flushes, pulsations in the head, visual images as of strokes and dots, together with general malaise and tiredness.

A glucose tolerance test at this stage revealed the following figures, with a fasting level at the lowest limit of normal.

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·080	0·117	0·130	0·106	0·080

Glucose was given, and when she was seen two months later there was definite improvement. Attempts were made to perform another glucose tolerance test, but such acute symptoms of hypoglycæmia developed on fasting that it was impossible to perform the test. Nine months later the general condition had improved very much. No further attacks had occurred, and a marked gain in weight had taken place. Three months later she was still able to carry on with her work. This patient lived in an isolated part of the country and previously had to be almost constantly under medical supervision.

In this case there were associated endocrine disturbances, as the patient had not menstruated for two years.

CASE V.—The patient was a male, aged thirty-three years. The first symptom in this man was an attack of unconsciousness which ushered in a prolonged condition of hypoglycæmia. In the summer of 1916, whilst marching to the Suez Canal, after three hours, he felt as though he were being dragged down, was dreadfully weary and entirely lacking in energy. Gradually black and white spots appeared before his eyes. After twenty minutes he fainted for five to six minutes, and had to be taken in a maltese cart. At the time of the first consultation he complained of dizziness, a cold feeling, and of everything going black in front of him. These attacks usually occurred before breakfast, and were most likely to come on if he went without meals. The attacks were preceded by a feeling as if the stomach were gripped by a knot and followed by numbness. He also suffered from headaches of a recurrent migrainous type, worse on Sundays. A glucose tolerance test revealed the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·113	0·124	0·127	0·106	0·079

The importance of performing a glucose tolerance test in preference to a single sugar is illustrated in this case.

He was advised to take 14 grammes (half an ounce) of glucose three times a day. Two months later he felt much more energetic and the faint turns were less frequent. The headaches still recurred on Sunday. In searching for a cause of the headaches we discovered that he went to Mass on Sundays, and had breakfast one and a half hours later. The glucose was increased to 28·3 grammes (one ounce), to be taken three times a day, and he was told to take the same quantity early on Sunday morning. One week later he felt much better, and there had been no headache on the intervening Sunday. In this period he gained 2·025 kilograms (four and a half pounds) in weight. As a therapeutic check-up we ceased the administration of glucose for two weeks. During this time all the gained ground was lost. Headaches recurred, and weight was lost, but the dizzy turns were still absent. The taking of glucose was advised two weeks later. He was again much better.

This man receives a pension, and there is every reason against his improving after so long a period. His main complaint was that all his troubles had, hitherto, been considered imaginary.

CASE VI.—The patient is a female aged fifty-three years. She complains that on rising in the morning she feels faint and trembling as if she is going to collapse. On several occasions she has fainted, falling and hurting herself, afterward having no recollection of the occurrence. This is relieved by a cup of tea and some bread and butter. Similar attacks also occur after working or walking any distance. She is always relieved by food or a drink of water. This patient had been attending the out-patient department for four years, and although she felt better generally, attempts to relieve the attacks had been in vain until glucose was given.

The glucose tolerance test revealed the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·068	0·114	0·141	0·129	0·114

The causal factor in this case is doubtful.

The Epileptiform Type.

Carr[16] and Baumhauer[24] have reported cases of epileptiform type, and most authors refer to the occurrence of epileptiform seizures as symptoms of excessive lowering of the blood sugar. The following case occurred in our series.

CASE VII.—The patient was a male aged twenty-seven years. He was first seen on April 19, 1932. Except for an occasional morning headache, this patient had been quite well till ten days previously, when the attack about to be described occurred. On that occasion, breakfast was taken at 7.30 a.m., and a very hurried lunch at 1.15 p.m. In the patient's own words, he "just threw the food down". After lunch there was an urgent desire to pass urine. Then a strenuous game of tennis was immediately commenced. It was a very hot day, and the most strenuous game he had played for years. Play finished at 3 p.m. and at 3.30 p.m. a fit occurred. This was followed by five others, and he was semi-conscious for forty-eight hours, with intermittent vomiting. The fits were described by the attending physician as epileptiform in character.

After forty-eight hours there was a gradual return to normal. Whilst playing the game of tennis the patient was informed by friends that he was continually doing foolish things, such as trying to throw or give his racket away. Of this he has no recollection.

Ten days after the attack there was still some fullness in the head, and at times a tight sensation around the neck. Kidney function tests were normal. The blood urea was 44·6 milligrammes per 100 cubic centimetres. (The blood urea is frequently raised in attacks of acute hypoglycæmia.) There was no reaction to the Wassermann test; a test meal revealed hyperacidity. The glucose tolerance test yielded a normal curve except for a low normal fasting sugar. This is a common finding when the patients are well. A similar test performed four months later gave the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·080	0·132	0·146	0·079	0·077

After the test the urine contained sugar (++) and acetone (+), indicating a low renal threshold. On this occasion the curve was more definitely hypoglycæmic.

On account of the persistence of head fullness and tightness around the neck, a lumbar puncture was performed three weeks after the attack. This revealed a slight increase in pressure to 26 centimetres of water. Cell count, globulin and Wassermann test revealed no abnormality. The disks were normal, and no abnormal neurological signs were found at any time. Septic tonsils were removed six weeks after the attack. From the beginning 14·15 grammes (half an ounce) of glucose, night and morning, were given. There have been no further fits, and the patient now remains very well. The appearance of this patient suggested some pituitary disorder, but an X ray examination revealed no abnormality of the sella.

The Abdominal Type.

Epigastric pain and generalized abdominal distress are recognized symptoms of hypoglycæmia, but we have been unable to find reports of any severe examples of this type. The following patient had been admitted to a surgical ward for observation as suffering possibly from an acute abdominal condition. He gave the following history:

CASE VIII.—He was twenty-three years of age, and was admitted to a surgical bed, complaining of severe pains in the right iliac fossa. There had been no vomiting. The attack occurred following severe exertion at scrub cutting.

Physical examination demonstrated the absence of any rigidity or tenderness. The house surgeon made the following note: "Careful observation shows that the patient is hysterical or malingering; also that he is of a definitely effeminate type." This patient was seen by one of us, who suggested that acute hypoglycæmia was the probable cause of the attack. A glucose tolerance test performed three weeks later showed the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·069	0·129	0·104	0·100	0·081

All other investigations failed to reveal any abnormality. Symptoms were relieved by glucose, and the patient has kept well since by continuing the treatment.

The Migrainous Type.

Migraine possesses a definite familial tendency, and numerous theories have been advanced as to its ætiology. Many cases seem definitely to depend upon some severe metabolic disturbances. Not every case is associated with a lowered blood sugar, but the administration of glucose benefits those in which hypoglycæmia occurs. Cammidge stated that migraine is commonly associated with hypoglycæmia, but in our experience the percentage of such cases is not great.

CASE IX.—The patient, a female aged thirty-seven years, complained of headaches of a recurrent migrainous type, mostly at week-ends. Later, headaches occurred almost every day, frequently relieved by food, but rich foods seemed to accentuate them. The glucose tolerance test revealed the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·052	0·124	0·130	0·097	0·074

After one month on glucose and barley sugar, she gained in weight and had only four headaches in three weeks. Twelve months later there was only an occasional headache, brought on by tiredness or excitement, and the appetite was much improved.

CASE X.—The patient was a female aged nineteen years. In August, 1931, she had a late and exciting night, after which she did not go to bed. Early the following morning, whilst working, she experienced a sudden severe headache, followed by dizziness. She sat down, was not unconscious, but had a very peculiar feeling in the head. Since this attack she has never felt the same. Headaches have been recurring at irregular intervals, together with similar but milder turns.

All systems were clear. The glucose tolerance test gave the following results:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·052	0·134	0·141	0·192	0·082

After taking glucose there has been no recurrence of the attacks, and headaches have been less severe. However this patient has not been completely restored to normal, as there still remains a severe neurosis.

CASE XI.—The patient, a male aged thirty years, for six years had been having recurring bilious attacks. Usually following excitement or after a busy day he awakened the next morning, or late the same night, with a severe headache. Gastric discomfort set in, and the headache became most intense, till vomiting occurred, which gave relief. An uncle of the patient suffers from similar attacks.

On examination all systems were clear. Tonsils were enlarged and septic. The glucose tolerance test gave the following results:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·063	0·113	0·163	0·124	0·072

This patient has been lost sight of, and a follow-up is impossible.

The Asthmatic Type.

Cammidge[39] reported two cases of true bronchial asthma with fasting blood sugar of 0·035% and 0·077% respectively. The condition of both these patients was improved by giving a diet richer in carbohydrate, together with glucose.

CASE XII.—A female, aged thirty-six years, complained of attacks of asthma almost every night. The sinuses have been operated on many times, and there is still some residual discharge from the ethmoid region. There was no response to protein skin tests. The glucose tolerance curve was as follows:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·062	0·093	0·123	0·093	0·093

Four months ago a diet rich in carbohydrate was prescribed, together with glucose night and morning. There was only one attack during the first week of treatment and none since, and the general health has been much better. She feels better than for years, and there has been a gain in weight of 3·15 kilograms (seven pounds), after a steady loss of 18·9 kilograms (three stone) in the last two years. This patient has developed a neurosis, a natural corollary to eighteen years' chronic invalidism. This is slowly improving, and eventually should be completely relieved.

The finding is far from common in asthma; but those patients with a low blood sugar derive definite benefit from glucose.

The patient in Case XXIV, described under heading of acidosis, was of interest as she had been treated for asthma for several years without any improvement. The administration of glucose completely relieved the condition.

The Vertiginous Type.

Cammidge states that a diagnosis of Ménière's disease may at times be made, especially if there happens to be deafness. The following patient suffered from attacks simulating Ménière's disease.

CASE XIII.—The patient was a female aged thirty-two years. During the last fourteen months, since a pregnancy which was accompanied by severe vomiting, attacks of unconsciousness had occurred. At first there was a sudden feeling of giddiness, objects appeared to rotate, then everything "went black", and she would fall over, at times hurting herself. These attacks almost always occurred when fasting, but once or twice had occurred soon after a meal. They occurred on the average of two to three times a day. Vomiting occurred at frequent intervals, with no definite relationship to meals.

The fasting blood sugar was 0·068%. When fasting, at the time of the blood sugar estimation, giddiness commenced, but the attack was aborted by lying down. The systolic blood pressure was 95 millimetres of mercury, the diastolic 65 millimetres. All other systems were normal. The patient was given two sticks of barley sugar a day, and when seen three weeks later, there had been no turns after the first two days on barley sugar. The vomiting still persisted, but gradually ceased as the system adjusted itself to the altered *régime*. One month after treatment commenced three teeth were removed, and she was unable to eat. Two attacks occurred the day after starvation; but no more since resumption of treatment.

The Cardiac Type.

Most patients complain of some precordial distress or discomfort. Modern[40] quoted one case in which the accidental use of twice the amount of insulin immediately produce weakness, dyspnœa and

constant precordial distress. The symptoms almost entirely disappeared after the resumption of the correct dosage. He also referred to a patient reported by Turner, who suffered from typical transient anginal pain as a result of hypoglycæmia, due to insulin overdosage.

CASE XIV.—The patient, a female aged thirty-seven years, always awoke feeling tired in the morning, but felt better after breakfast. She could work for two hours, then felt "absolutely knocked out" and had to lie down, and at times felt as if she was falling through the bed. She was often forced to eat some food on account of a frightful empty feeling. Energy was always restored by food, but fatigue returned after an hour or two at work.

On October 11 she was shopping all day and had eaten no food after a small breakfast at 8 a.m. At 4 p.m. whilst walking her "heart choked her", there was a smothering and tightening around the chest, and a severe pain beneath the sternum. She had to stop, gasping for breath for a few minutes, then recovered, but felt very weak for a time. A similar attack had occurred about three weeks previously under identical conditions of fasting.

The fasting blood sugar was 0·077%. The cardiovascular system was normal, there was no evidence of cardiac failure. A skiagram of the heart and an electrocardiogram revealed no defects. There was no response to the Wassermann test. Treatment with glucose enabled her to work through the day without fatigue, and she felt much stronger. She complained of her muscles being stiff on account of working all day, which she had never been able to do before.

Chronic Hypoglycæmia.

With Acute Exacerbations.

The fulminating types really come under this heading, as most of them have symptoms of chronic hypoglycæmia.

CASE XV.—The patient, a female aged thirty-five years, complained of being easily fatigued, and unable to do her work well. She also suffered from acute attacks. These came on after severe exertion, especially in the summer time. Just before the attacks she felt exceptionally well and bright. At first there was a trembling in the hands and legs, followed by pressure across the chest. She "felt too tired to breathe and went very pale", and at times perspired. She then had to lie down for fifteen to twenty minutes, after which improvement commenced, followed by an intense hunger. After food she felt well, except for some tiredness. This patient had an enlarged thyreoid, but the basal metabolic rate was normal. Other systems were clear. The fasting blood sugar was 0·081%. Since taking barley sugar there had been no attacks for three months, and there was a general feeling of well-being. Instead of being able to work for only one to two hours, she can now perform a full day's duty.

A persistent urticaria developed at this stage and an elimination diet was prescribed in an effort to find the cause. The administration of barley sugar was suspended. The urticaria disappeared after a fortnight. A week later she asked to be allowed to resume the barley sugar as she was unable to carry on without it on account of fatigue and the recurrence of the attacks.

CASE XVI.—The patient, a female aged fifty-two years, complained of an uncanny hollow feeling and of great weakness, usually when fasting and relieved by food. There was a smothering sensation from under the ribs and fullness in the head, with clammy hands and sweating. She never felt normal and became tired very easily. The appetite was poor and she took no sugar. There had been a gradual loss of weight. A test meal revealed a mucous gastritis with achlorhydria. The fasting blood sugar was 0·065%.

Glucose medication at first produced severe flushing, fullness in the head and prickling in the hands and feet. This gradually settled down and she felt somewhat better. This patient has had numerous forms of treatment over a period of five years and has developed a definite neurosis. Time will show whether this will disappear completely. The prognosis after such a long period of futile treatment is not very good.

Without Acute Exacerbations.

Individuals without acute exacerbations suffer mostly from chronic malaise, tiredness on exertion, and from many of the nervous symptoms previously tabulated. Most patients, at one time or another, suffer from acute symptoms, due to an excessive lowering of an already subnormal sugar level.

CASE XVII.—The patient, a female aged thirty-six years, for many years had awakened practically every morning at about 4 a.m. with an empty feeling; a headache then commenced and increased till food was taken, when it gradually disappeared. The last food of the day was taken at 5 p.m. The appetite was good, and fatty foods were preferred. She was easily fatigued, especially after exertion. There had been a loss of one stone in weight during the last twelve months. Until two years ago, regular monthly bilious attacks occurred.

All systems were clear. The systolic blood pressure was 110 millimetres of mercury, the diastolic 70 millimetres. A glucose tolerance test revealed the following subnormal curve:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·063	0·123	0·114	0·100	0·086

Treatment took the form of more frequent meals, barley sugar during the day, and an orange drink with half an ounce of glucose last thing at night. When the patient was seen again three weeks later there had been no headaches after the first three days of treatment, and she felt much better and more active. Now, eight weeks since commencement of treatment, there has been no recurrence of symptoms. Owing to an increased appetite, resulting in more frequent meals and supper before bed, glucose no longer is required.

CASE XVIII.—The patient, a female aged twenty-five years, complained of being easily fatigued and lacking in energy. She awoke in the morning very tired, but felt better for an hour or so after breakfast. Food always revived her for half to one hour. After about half an hour at work she was unable to carry on, and fainted on several occasions. There was more or less constant precordial distress, worse after exertion.

The cardiovascular system was normal. The red cell count was 4,580,000 per cubic millimetre, and hæmoglobin value 85%. A glucose tolerance curve showed the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·070	0·123	0·093	0·093	0·080

The early morning specimen of urine contained acetone.

CASE XIX.—The patient, a female aged forty-two years, complained of being always tired and having no energy, particularly in the summer time.

Examination of the various systems revealed no pathological defects. A glucose tolerance test showed the following figures:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·066	0·113	0·138	0·106	0·077

Symptomless Hypoglycæmia.

Cammidge has drawn attention to the occurrence of blood sugars as low as 0·040% in individuals who maintained that they were perfectly well. This type would be discovered only accidentally, or by the performance of routine blood sugar estimations; consequently none occurred in our series.

RELATIVE HYPOGLYCÆMIA.

Simple Relative Hypoglycæmia.

In these individuals an apparently normal or slightly raised blood sugar may yet be too low for their needs. The hyperpietic who is more comfortable with a high, rather than a low, pressure is a parallel example.

When the symptoms are suggestive of a hypoglycæmia, a glucose food test should be tried out, even in the presence of a normal tolerance curve. That the condition of some of these patients with a

normal blood sugar improves with extra glucose will serve as a reminder that in the last analysis function is the final arbiter.

If the following patients had been refused glucose on account of a normal tolerance curve, much benefit would have been missed.

CASE XX.—The patient, a female aged forty years, was first seen six months ago, when she complained of headaches present all her life, but more severe after a tiring day, and in the summer. She was advised to take barley sugar at frequent intervals. When she was seen two weeks later the headaches had completely disappeared; when again seen five months later, she had had only one headache. There had been many other forms of treatment without success.

As a point of interest, a glucose tolerance test was performed which revealed the following normal curve:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·092	0·145	0·166	0·141	0·095

If this patient had been treated on the result of this test, she would have been deprived of the benefits of glucose. Her only worry is that she is gaining weight.

CASE XXI.—The patient, a female aged twenty-two years, single, was brought for treatment on account of a tendency to emotional depression, with "fits" of weeping. She was nervous of strangers, and had, during the last two years, rarely left the house. Irritability was a marked feature, and three months previously, she had had an epileptiform convulsion, in which the teeth had been clenched but the tongue was not bitten. She presented a serious behaviour problem, and a diagnosis of *dementia præcox* was seriously considered. A history of persistent anorexia, periodic vomiting, and small food intake suggested the possibility of hypoglycæmia.

The blood sugar tolerance test revealed that this tendency was present, the figures being as follow:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·082	0·129	0·129	0·109	0·090

A test meal showed a rising curve with considerable hyperchlorhydria in the later stages; the free hydrochloric acid figures were 23, 10, 0, 15, 32, 38, 38, 65, at fifteen minutes intervals. Treatment by alkalis, frequent feedings and administration of glucose has produced a remarkable alteration in the symptomatology. The patient feels better, has more energy, and has lost most of her nervous fears. Her reclusive habits have largely disappeared; she is able to make numerous normal social contacts. The diagnosis of *dementia præcox* no longer presents itself.

This patient ceased taking glucose one year after commencement of treatment with immediate return of symptoms.

CASE XXII.—The patient was a female aged eleven years. She was brought for treatment on account of syncopal attacks occurring principally in the early morning. In addition, she was always tired, irritable and unable to concentrate. The sugar tolerance test showed a normal fasting level, but a low level at the end of one and a half hours after the administration of glucose.

This child, after treatment with glucose, has become perfectly normal and very active.

We have observed several other cases of this type, but have only mentioned these three examples to show that the condition occurs.

Relative Hypoglycæmia Associated with Incomplete Fat Metabolism.

The sub-group of those associated with incomplete fat metabolism includes those cases of cyclical vomiting, and associated states of acidosis, occurring in childhood. These children appear to lack the power of completely assimilating fats, so that acetone and diacetic acid are formed and acetone is found in the urine. Fats are burned in the flame of carbohydrates and a normal individual obtains sufficient carbohydrates for this purpose in an average mixed diet; but these children need extra carbohydrate in a simple form. Butter fat is the most difficult of assimilation and this, together with egg yolk, needs to be very much restricted. Various conditions of general ill-health, liability to infections, and allergic states, occur associated with this defect. The children are usually of a nervous disposition and frequently under weight; they often suffer from night terrors, attacks of vomiting, bouts of temper, enuresis and a persistently irregular temperature, which rouses fears of some latent tuberculous infection.[41] One of us has seen a case where the diagnosis had been, amongst other things, endocarditis, subacute rheumatism, tuberculous meningitis, and in which all the symptoms disappeared with the administration of glucose and a low fat diet.

"These children appear to live upon a curve, or in a cycle, with an inveterate tendency to fall suddenly, and often without ascertainable cause, from a state of good health and well-being to a state of indefinite illness, in which complaints of prostration and fatigue, pallor, indefinite transitory pains in all situations, persistent irritability of temper, vomiting, and loss of weight, are more or less constant." They stand infections and anæsthetics badly, and before administering the latter it is advisable to give glucose.

When cyclical vomiting occurs, the diagnosis may be difficult, especially during the first attack. Intestinal obstruction, meningitis and appendicular colic are of especial interest. It is a serious thing to remove the appendix in a child suffering from cyclical vomiting, besides being of no value.

Although a good deal of attention has been paid to this condition in childhood, it has not been sufficiently stressed that the disability may persist in adult life. These individuals continue to suffer from symptoms due to an acidosis, and although the glucose tolerance test may give normal results, definite benefit is derived from the administration of glucose.

Some of the cases listed under the heading simple, relative hypoglycæmia may belong to this subgroup, although no acetone was found in the urine at the time of examination.

These cases are relatively common in childhood, but only a few typical examples have been included in this series.

CASE XXIII.—The patient, a female aged eleven years, in May, 1931, commenced to have monthly bilious attacks, with vomiting and prostration, usually commencing early in the morning and lasting for about a day. Six months later vomiting occurred every morning at about 5 a.m., and this was accompanied by a fear that she was going to die. Practically no breakfast was eaten on account of the tendency to vomit afterwards. Fainting occurred on one occasion. The patient was brought for treatment as presenting a behaviour problem.

Since treatment by glucose and increased carbohydrate feeding she has been perfectly normal. With the increased appetite and food intake, glucose is no longer necessary to maintain good health. Apparently, in this case, the temporary administration of glucose broke the vicious circle and permitted the resumption of a normal metabolism.

It is interesting to note that the mother always gave the child very little sugar and cakes, on account of damaging the teeth.

CASE XXIV.—The patient was a female child aged seven years. The attacks had been present practically all her life, and were usually precipitated by a fright, coming on about thirty-six

hours afterwards. The probable mechanism was: Fear→secretion of adrenaline→hyperglycæmia→depletion of poor glycogen stores→hypoglycæmia.

On the first day there was a rapid pulse and high colour. The bowels were constipated and the hair lost its gloss. On the second day the complexion became paler, and breathing gradually increased in rate and depth. At this stage she lay down and became at times stuporous, still with rapid deep respirations. She refused to be propped up and was always more comfortable lying down. A cough frequently developed at this stage, with, at times, blood-stained sputum. The breath smelt musty, as though she had been closed in a room all night. The cough and general malaise would usually take a week to settle down.

Frequent feedings with barley sugar were advised, and there has been only one attack in the last two and a half years, and that was when no barley sugar was available. The whole mental outlook of the child has changed. Previously she was nervous and afraid to cross the street. Now the general health is good; she is always bright, has lost all sense of fear and has regained confidence in herself. Colds which were frequent now rarely occur. This case had been treated as asthma for several years, and as would be expected, administration of adrenaline caused a temporary improvement, followed by further exacerbation. There are four girls in this family; two are fair and free from any attacks; two others, including the patient described, are dark and both suffer from similar attacks.

As a matter of interest, a glucose tolerance test was made recently, two years since commencing treatment. This proved to give normal results, as with most patients suffering from acidosis.

This child's father has a definitely diabetic tolerance curve, the figures being:

Fasting.	½ hour.	1 hour.	1½ hours.	2 hours.
0·093	0·209	0·249	0·163	0·152

CASE XXV.—The patient, a female aged twenty-one years, complained of a migrainous type of headache, especially after an exciting day, or over-fatigue. These headaches were sometimes present on waking, or might work on gradually during the morning. She was very easily tired and had a poor appetite. On an average the headaches occurred about once a week. There was a history of recurrent "bilious" or "vomiting" attacks. The eyes were tested, and glasses prescribed without improvement being noted. The sinuses were examined and pronounced clear. A glucose tolerance test showed a low normal curve.

After a month on glucose the severity and frequency of the headaches had been much reduced, and the patient said she felt better than for twelve months. Nine months later she felt much better and was standing up to things very well. The headaches and bilious attacks were much less frequent, and the appetite much improved. It is noteworthy that her eyesight has shown great changes. Whereas previously she could not read or sew for more than a few minutes, she is now able to work for hours on end. Her frequent visits to the ophthalmic surgeon have ceased. On the psychological side, a personality which can only be described as ultra-hysterical has shown a profound alteration. The removal of her "organ inferiority" has led to the growth of self-reliance and a changed outlook on life's problems.

TREATMENT.

Attention must be drawn to the fact that hypoglycæmia is a condition and not a disease. As Cammidge has pointed out, "it is an accompaniment of many disorders". Not always is one able to say to the patient: "Eat more, take glucose, and all will be well". In the majority of patients a careful search will reveal other defects which need systematic attention. In the cases which we have described will be noted a number of somatic disturbances, including endocrine maladjustment.

Septic foci should be attended to, and a regular action of the bowels obtained. Half an ounce of glucose may be given alone or in an orange drink; usually night and morning is sufficient, but in some cases an extra dose may be given during the day. Barley sugar or boiled sweets are just as effective, and are preferred by most patients, especially children, the usual amount being three to four ounces a day. It is of advantage to encourage the patient to eat between meals. In cases of acidosis it is necessary to restrict fats, especially butter, and to allow eggs only in very small numbers.

COMMENT.

In the study of cases of hypoglycæmia it is very important to perform a glucose tolerance test in preference to a single fasting sugar test. The reason for this statement was borne out in several of our patients in whom there was a normal fasting sugar but a very low figure at the end of one and a half to two hours. We suggest the following as the most feasible explanation of this phenomenon. A patient is told that there is to be a blood test and no breakfast

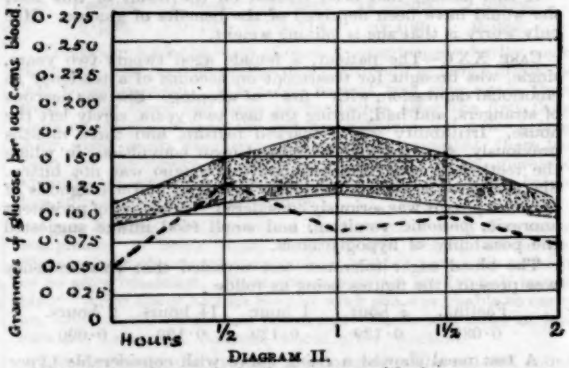

DIAGRAM II.
Showing subnormal fasting sugar with low curve throughout.

is to be eaten. His nervous tension is naturally increased and the fear mechanism brought into play. These factors result in a secretion of adrenaline which mobilizes glycogen from available stores. This gives rise to an increase in the blood sugar which is a false reading brought about by undue nervous stresses. Many of the patients are of a nervous disposition, so

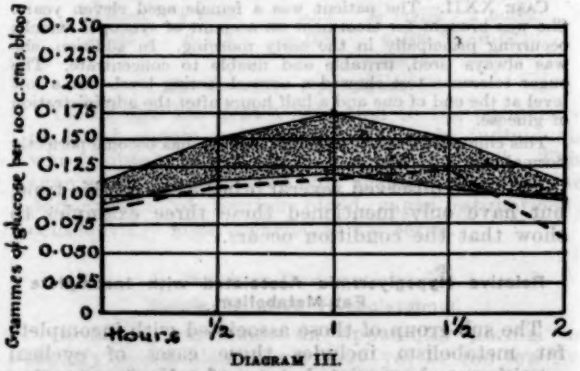

DIAGRAM III.
Showing normal fasting sugar with subnormal level at end of two hours.

that in them this factor would be acting to an advanced degree. It is recognized that at the time of severe nervous tension, glycosuria sometimes occurs, and the cause in the two conditions must have a similar basis.

Hypoglycæmia, with its attendant train of symptoms, is to be regarded in the light of a metabolic disturbance due to many causes; much in the same manner as pyrexia, with its sequelæ, is universally held to be merely an outward manifestation of diverse phenomena. Just as pyrexia *per se* is often treated with advantage to the patient, so does the treatment of hypoglycæmia *per se* aid in improving the patient's well-being. Even a short course of glucose medication may be sufficient to alter the situation by breaking those widespread vicious circles which create such a vivid and varied symptomatology in both acute and chronic disease.

It will be noticed that the period of observation in some of the cases has been short. Nevertheless, the immediate benefit obtained by treatment suggests the reality of the hypoglycæmic entity, and in view of our experience of cases under survey for a longer period, a more permanent benefit may be prophesied. In any case, even an immediate response is useful from a psychological point of view. We have endeavoured to exclude impartially the effect of suggestion. This has been easy in many, since other remedies have been tried in vain. Furthermore, the suggestive effect of such a simple substance as barley sugar is negligible.

We would draw attention to the action of some natural protective mechanism which promotes a spontaneous recovery from an attack of hypoglycæmia. It is well known that an excess of carbon dioxide in the blood stimulates the respiratory centre, causing increased respiration. Although the blood sugar falls sufficiently low to cause coma, death from a further fall rarely ensues. These patients usually recover without the administration of glucose, so that the extremely low blood sugar must stimulate some centre, nervous or endocrine, which causes secretion of adrenaline and this mobilizes fresh supplies of glucose from available glycogen stores.

In conclusion, may we state that based on a fundamental metabolic dysfunction, the symptomatology of hypoglycæmia is variable in the extreme—a fact which makes its recognition a necessity in every branch of medicine. We believe that in the course of time hypoglycæmia will become an important clinical entity, as well known as hyperglycæmia. It is not inconceivable that hypoglycæmia may even be of greater clinical importance than diabetes. Assuredly, the results of treatment in typical cases are more dramatic and simple to obtain.

Summary.

1. The ætiological factors of hypoglycæmia have been discussed.

2. A new classification of the types of hypoglycæmia has been suggested.

3. Twenty-five original cases have been reported.

4. Hypoglycæmia is of considerably greater importance in all branches of medicine than has hitherto been considered to be the case.

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SOME USEFUL TESTS IN THE DIAGNOSIS OF COMMON CLINICAL CONDITIONS.[1]

By ETHEL BYRNE, M.B., Ch.M. (Sydney),
Pathologist, Newcastle Hospital, New South Wales,
AND
RUBY BEVERIDGE, L.R.C.P. (Glasgow), D.T.M. (Liverpool).

Pyrexias of Unknown Origin.

IN investigating pyrexias of unknown origin the examinations most likely to be of help are: the leucocyte count; blood culture; Widal test; examination of catheter specimen of urine; examination of fæces, cerebro-spinal fluid, sputum and pleural fluids.

The leucocyte count is increased in all cases of acute inflammation and suppuration, for example, pneumonia, appendicitis, meningitis *et cetera*. The leucocyte count has a certain prognostic value. For example, a pneumonia patient with a leucocyte count of 20,000 per cubic millimetre and a polymorphonuclear count of 90% is fighting well and will probably recover. A count of 12,000 is not so reassuring and a leucopenia almost certainly forebodes a fatal issue.

The type of polymorphonuclear cell present is also of prognostic value, a predominance of cells with a one or two lobed nuclei indicating a good reaction on the part of the bone marrow. The Schilling index is based on this fact. Formerly, the Arneth index was used as an index of prognosis in tuberculosis, the preponderance of polymorphonuclear cells with four to six lobed nuclei being considered of bad import.

The leucocytes are diminished almost constantly in typhoid fever, malaria and influenza; and a leucocyte count is probably the most reliable evidence in early stages of enteric infection. A patient who complains only of headache and malaise, and who has fever with a leucocyte count of 3,000 to 5,000 per cubic millimetre, with a relative lymphocytosis, is almost certainly developing typhoid fever.

Although there is a leucopenia in influenza, the count usually is about 6,000, with a relative increase in mononuclear cells, and there are clinically more severe symptoms. In malaria a definite leucopenia occurs, with increase of mononuclear cells. The diagnosis will be established by finding the malaria parasites in a stained film. For this examination it is essential to take films during a rigor, or at the time of maximum temperature. In cases of malignant malaria there may be no rigors, the patient remaining in a typhoid state. A blood film will usually show the typical crescents.

A blood culture is of great value in the early stages of an enteric infection. Typhoid starts as a septicæmia, and the organism may be isolated from the blood up to the eighth or tenth day, that is, long before a positive response to the Widal test is obtained. Typhoid bacilli grow readily in ordinary peptone broth, so that no special media *et cetera* are required.

If a generalized blood infection is suspected, for example, in a puerperal condition with fever, a blood culture is of help to confirm the diagnosis. It is important to take the blood at a time when the patient has the maximum daily temperature, as the organisms are in greater numbers in the blood; it is occasionally possible to demonstrate the causal organisms in stained films of the blood. This occurs especially in anthrax septicæmia.

The Widal test usually gives a positive result ten days from the rise of temperature. This depends on the presence of the blood of agglutinins, which agglutinate the organism responsible for the infection. It is not considered diagnostic of infection below a dilution of one in 80 for typhoid and paratyphoid *B* infections, though paratyphoid *A* infections sometimes fail to give a reaction in dilutions above one in 40.

When patients have previously had typhoid fever or have been inoculated against typhoid and paratyphoid *A* and *B* infections, the serum may agglutinate all three organisms in dilutions of one in 20 to one in 40. It is then necessary to repeat the test after two to three days, when increase in the titre of the serum against one organism of the group is diagnostic of infection with this organism. One occasionally encounters a case which clinically appears like a mild typhoid infection, but presents a marked rash on abdomen and thighs, and fails to give any of the tests for typhoid fever. The probability is that the patient is suffering from Brill's disease or pseudo-typhus, and this can be investigated by the Weil Felix test.

The Weil Felix test depends on the power of the serum to agglutinate *Bacillus proteus* X19, and is carried out in exactly the same way as the Widal test, only that freshly prepared emulsions from twenty-four hours' culture of *Bacillus proteus* are used. The result of the test is positive from the fourth day of the disease. This test is not specific, as is the Widal, in that the organism agglutinated is not the cause of the disease, but it occurs with remarkable constancy in cases of true typhus fever and in Brill's disease.

In arranging these tests in order of importance we should probably have put the examination of a catheter specimen of urine first on the list. Pyelitis may fail to cause any of the classical symptoms of pain in the side and back, frequency *et cetera*, or may so accurately simulate an acute abdominal or pelvic condition, that the examination of a catheter specimen should never be omitted. The heart of many an obstetrician has been cheered by the finding of pus and *Bacillus coli communis* in the urine of a patient who has had a rigor or has a high temperature at any stage in the puerperium.

Examination of fæces is indicated when a case which is typically enteric fever clinically fails to give a positive blood culture or Widal reaction. For this examination it is essential that the specimen of fæces be freshly passed, otherwise organisms of the typhoid, dysentery group will be rapidly outgrown by *Bacillus coli communis*, which is always present in stool. The

[1] Read at a meeting of the Central Northern Medical Association, New South Wales, on October 19, 1932.

occurrence of a non-lactose fermenting bacillus, Gram-negative motile, is suspicious of typhoid, paratyphoid *A* or *B* infections. The fermentation tests with other sugars, glucose, maltose saccharose *et cetera* determine to which of the typhoid group the organism belongs. Having established the identity of the organism culturally, it is necessary to test it against the corresponding agglutination serum, and as a matter of interest and for a certain prognostic import to test it against the serum of the patient.

It is usually an unfavourable sign for a patient with typhoid infection to fail to give a positive Widal reaction.

The importance of a cerebro-spinal fluid examination was evidenced in the early months of 1932, when from time to time there occurred cases showing the clinical features of drowsiness, vomiting, irritability, photophobia, and temperature constantly about 38·3° C. (101° F.), with pulse rate more rapid than usually occurs with such temperature.

Lumbar puncture in practically every case yielded a clear fluid, under increased pressure, containing an increase in cell content, increase in globulin and normal sugar content. These findings are looked upon as diagnostic of the preparalytic stage of anterior poliomyelitis. Cases with paresis or established paralysis sometimes fail to show a cell increase, but the globulin increase is very constant.

The cerebro-spinal findings in encephalitis are seldom of much help, except that from their negative character they suggest that the condition is not meningitis *et cetera*.

A purulent cerebro-spinal fluid with diminished sugar content occurs in meningitis due to meningococci, pneumococci, influenza *et cetera*, in which cases it is usually possible to demonstrate the causal organism in stained films. In a tuberculous meningitis the fluid is clear, under increased pressure, shows increase in globulin, diminished sugar and increase in cell content, lymphocytes predominating. It is sometimes possible to demonstrate the bacillus in a stained film, but it may be necessary to inject a guinea-pig for confirmation.

Examination of sputum is indicated when there is a cough with sputum. Even in the early stages of a classical case of pneumonia, it is useful as the type of pneumococcus can be determined, and serum used if occasion arises. If the temperature remains high after seven to nine days and there is much sweating, the sputum examination will determine whether the chest condition is tuberculous or not.

If the temperature does not settle, and aspiration of the chest yields purulent fluid, examination will reveal the organism present, and will determine whether operation is necessary. The presence of large numbers of pus cells and pneumococci usually indicates the need for operation as early as possible; if streptococci be present, frequent aspiration may obviate the need for operation.

If the fluid withdrawn contains large numbers of lymphocytes, it is very suggestive of tuberculosis; the bacilli may be demonstrated in stained films, or animal inoculation may be required to confirm the diagnosis.

Urine Containing a Fehling or Benedict Reducing Substance.

It not infrequently happens that a reducing substance is found in the urine during the course of a routine examination of urine for insurance, or in cases of pregnancy. In the first place it is important to be sure that the substance present is glucose. This can be determined by the fermentation test with yeast, which ferments glucose, but not lactose or pentose. Lactose commonly occurs in the urine from the sixth month of pregnancy and during lactation, and is a normal finding.

The presence of glucose having been established, it remains to be decided if the condition is a true diabetes or a renal diabetes.

If the early morning specimen from a patient on unrestricted diet is sugar-free and urine after breakfast contains sugar, it is most likely that the patient is suffering from renal diabetes. This can be determined by plotting a blood sugar curve.

It is important to have the urine sugar-free before commencing the test for two reasons, one, because one is able to determine the lowest level to which the blood sugar can be reduced by dieting alone, two, because one can then determine at what concentration of blood sugar appears in the urine.

The procedure is as follows. A fasting specimen of urine is collected, and 0·2 cubic centimetre blood is taken from the patient, who then drinks a solution of 50 grammes of glucose in 100 cubic centimetres of water. The blood is taken at half-hourly intervals, and a specimen of urine also.

Normally fasting blood sugar is 0·08% to 0·11%. After taking glucose the blood sugar rises in the first hour to 0·16% to 0·18% and falls to normal or slightly below at the end of one and a half hours. No sugar appears in the urine at any stage in the test.

In a *diabetes mellitus* the fasting blood sugar may be normal, but the sugar concentration rises rapidly, and in a severe case continues to rise for two hours or longer, then falls very slowly. The delay in return to normal or fasting level is of more importance than the actual height of the curve. It frequently happens that sugar does not appear in the urine till the blood sugar concentration is 0·2% or higher, that is, the renal threshold for sugar is high.

One often notices in plotting a blood sugar curve on a diabetic patient that the fasting specimen of urine contains acetone and diacetic acid, the diacetic acid disappearing and acetone becoming less after taking glucose. This suggests that the patient is having a diet badly balanced as regards carbohydrates and fats, and the medical attendant may find it necessary to increase the carbohydrate or cut down the fats. If, as sometimes occurs, the ketone bodies disappear after ingestion of sugar, but reappear before the curve is finished, the condition is more serious, as the ketones are probably being derived from the patient's own fat. In such cases it is frequently necessary to increase insulin, if the patient is having it, or if not, to start the patient with it.

In renal glycosuria the patient's fasting blood sugar is normal and sugar appears in the urine when blood sugar is 0·15%, that is, the renal threshold is low. The height of the curve never exceeds normal, and the concentration has fallen to normal at the end of one and a half hours.

There is one other type of glycosuria, which is associated with a typical curve. The fasting blood sugar is normal, but rises rapidly in half an hour to 0·2%. Sugar appears in the urine, and the blood sugar commences to fall and is only slightly above normal at the end of two hours.

This occurs in some cases of hyperthyreoidism, and in patients who are taking thyreoid. In the latter case, prohibiting the taking of thyreoid will do away with the glycosuria and cause the blood sugar to return to normal.

Albuminuria.

Albumin occurs in the urine in amounts varying from a faint trace to a thick, curdy precipitate which solidifies on boiling. The amount of albumin present has little bearing on the clinical aspect of the case, as a faint trace of albumin may indicate a far more serious renal lesion than "solid" albumin.

A very heavy cloud of albumin occurs in the urine without any apparent renal damage, as a psychical condition in patients before operation, in students before examination *et cetera*.

The examinations of value in investigating a case of albuminuria are as follows.

Microscopic Examination for Cells, Casts et cetera.—Red and white blood cells occur in the urine in nephritis, pyelitis, cystitis, simple congestion of kidney due to a failing heart, acute febrile conditions, and in new growths of the kidney or bladder.

Pus cells occur in all cases of infection of the urinary tract.

Casts are usually of serious import. They are of seven kinds. Granular casts are composed of a mixture of albumin, leucocytes, and red blood corpuscles. They are present in chronic nephritis. Hyaline casts occur in all forms of nephritis, and may be found in pyelitis or simple congestion of the kidney. Epithelial casts are composed of coagulated albumin and bear epithelial cells on the surface. They are numerous in acute nephritis and their presence means that the kidney is being seriously and permanently damaged. Blood casts occur in acute nephritis, in infarct and in renal congestion. Fatty and waxy casts appear in chronic renal disease, the latter particularly in amyloid disease. Pus casts only appear when there is actual suppuration.

Tests for Renal Efficiency.—The tests for renal efficiency of most value are the urea concentration test, blood urea content, and dye tests.

The urea concentration test depends on the ability of the kidneys to concentrate urea. If the urea percentage one hour after taking fifteen grammes of urea by mouth is 2% or over, the kidneys are functioning well.

The procedure is as follows: The patient is given a light meal at 6 o'clock at night. No fluid is allowed from then till the following morning (say 7 o'clock), when the patient is instructed to empty the bladder, after which he takes fifteen grammes of urea dissolved in 100 cubic centimetres of water and flavoured with tincture of orange. Specimens of urine are collected one, two and three hours after taking the urea, and the urea percentage is estimated in each specimen.

It sometimes happens that the urea has a diuretic effect and the patient passes large quantities of urine of low specific gravity and low urea content. Obviously the results obtained in such circumstances are fallacious and the test must be repeated, after restricting fluids for twenty-four to forty-eight hours. The volume of urine excreted should not exceed 120 cubic centimetres in the first hour and 100 cubic centimetres in the second and third hours.

While this test is one of the most reliable as regards indicating gross renal damage, it must be remembered that half the renal tissue may be functionless and yet the urea concentration test give a normal result.

The concentration of urea in the blood is very little influenced by ordinary mixed meals, but may be extensively reduced by great restriction of protein in the diet. For this reason it is advisable to estimate the blood urea at a known interval after the standard dose of urea has been administered.

A convenient method is to combine the urea concentration test with the blood urea estimation. Urea administered by mouth is readily absorbed, and the blood urea in a normal person is approximately doubled one hour after the standard dose of fifteen grammes of urea.

It is important to remember that certain extra-renal factors influence the concentration of urea in the blood, for example, severe gastro-enteritis, or any condition causing dehydration of the tissues. For this reason it is important to combine the blood urea estimation with the renal efficiency test. If the increase in blood urea is due to some extrarenal cause, the urea excretion by kidneys should be normal.

For surgical purposes many authorities consider that a blood urea of 50 milligrammes per 100 cubic centimetres of blood is a definite contraindication to a one stage operation for prostatectomy. It is recommended to do a suprapubic cystotomy followed by prostatectomy when blood urea has fallen to normal, usually in seven to ten days.

When a nephrectomy is contemplated, a blood urea estimation is indicated as a guide to the condition of the supposedly healthy kidney. If the blood urea is raised, it indicates impairment of function of the second kidney, as one healthy kidney is more than adequate to keep the blood urea at a normal level.

It is also advantageous to do a urea concentration test on specimens of urine collected by ureteral catheterization.

In addition the dye tests are of great value. These are carried out by the surgeon himself, and do not come into the sphere of the clinical pathologist.

In obstetric cases one must consider: (i) patients with albumin but no symptoms; (ii) patients with albumin, œdema, vomiting and headache; (iii) patients with albumin and threatened eclampsia.

In Group (i) the blood urea is usually normal, and patients go to term without any untoward event.

Group (ii) is subdivided into (*a*) nephritic toxæmia, really cases of pregnancy associated with chronic nephritis. Here there is marked nitrogen retention with blood urea over 40 milligrammes per 100 cubic centimetres of blood. In these cases it is advisable to terminate the pregnancy if the blood urea rises over 40 milligrammes per 100 cubic centimetres. Such cases may go to term, but at expense of increased renal damage. (*b*) Pre-eclamptic toxæmia. Here there may be no nitrogen retention and suitable

treatment by dieting *et cetera* will frequently allow patient to go to term.

There is always evidence of renal inefficiency in eclampsia, albuminuria, diminished output of urea and frequently increased blood urea. It is advised to induce labour if blood urea rises above 40 milligrammes per 100 cubic centimetres of blood.

The Medical Case.—In acute and subacute nephritis the blood urea is high on account of diminished excretion of urine, and it promptly falls when diuresis occurs, hence the prognosis based on blood analysis alone is uncertain, except in patients who have an exceptionally high blood urea, when the outcome is usually fatal.

A moderately high blood urea, say 100 milligrammes to 100 cubic centimetres of blood, is not nearly so serious in an acute nephritis as a similar finding in a chronic case. In the former there is a considerable tendency to recover; in the latter the lesion is usually progressive and prognosis should be based on the results of other renal tests in association with clinical findings.

In a chronic nephritis it is considered that a blood urea of 200 or over indicates that death will occur in six months; with a urea content of 100 death will occur in two years, while with minor rises the prognosis is indeterminate.

It must be remembered that a very low protein diet will reduce the blood urea to normal, though the patient is on the verge of uræmia and it is essential to estimate the blood urea and renal efficiency after giving the standard dose of urea.

These two tests are useful in differentiating between œdema due to cardiac disease and that due to renal disease. In the former the blood urea is approximately normal and the urea excreted by the kidneys 2% or more.

Reports of Cases.

OSGOOD'S DISEASE OCCURRING SIMULTANEOUSLY IN TWO BROTHERS.[1]

By KEITH ROSS, M.S. (Melbourne),
Brisbane.

Osgood's or Schlatter's disease of the tibial tuberosity falls into a group of diseases which affect the centres of ossification and whose exact ætiology is somewhat uncertain. Trauma is considered to be a causative factor, but it is uncertain if it is the sole factor. In view of Harbin and Zollinger's[(1)] report of four children of one family suffering from osteochondritis of the spine, the notes of two brothers simultaneously affected with Osgood's disease may be of interest.

Case I.

E.M., a schoolboy, aged fourteen years, attended the Brisbane Hospital on April 6, 1932, complaining of pain over the left tibial tuberosity for the past month. There was no history of injury. Examination disclosed a tender, diffuse swelling over this tuberosity, and an X ray picture revealed it to be fragmented. After two months' splinting all tenderness and swelling had disappeared, and an X ray examination showed a much more regular formation of the tuberosity.

[1] The patients described herein were shown at a meeting of the Brisbane Hospital Clinical Society on September 22, 1932.

Case II.

R.M., a schoolboy, aged twelve years, attended the hospital on May 7, 1932, on the occasion of E.M.'s second visit, and stated that his right leg had been painful for two or three weeks before his elder brother's, but he had not taken much notice of it until he saw his brother's leg in plaster. Again there was no history of trauma. Examination disclosed a tender diffuse swelling over the right tibial tuberosity, and an X ray picture revealed this to be much more poorly formed than the left. After three months' splinting all evidence of abnormality had disappeared and the X ray appearance of the two tuberosities had become nearly identical.

Both boys were in robust health, had clean throats, from which the tonsils had been removed, and had had no ailments for some years. To the time of writing there has been no recurrence.

Reference.

(1) M. Harbin and R. Zollinger: "Osteochondritis of the Growth Centres", *Surgery, Gynecology and Obstetrics*, Volume LI, August, 1930, page 145.

Reviews.

PSYCHOANALYSIS.

THAT Dr. T. A. Ross has followed up his work on "The Common Neuroses" by a recent publication is of considerable interest. The new work, "An Introduction to Analytical Psychotherapy", will serve to enhance the author's already great reputation.[1] Among his charms must be numbered modesty and honesty. As an example of the first may be cited that he belongs to no school, that the book is not even a summary but a personal record, and that though the book may have distorted Freud, anything that is fruitful in it has come originally from him. Concerning honesty, Dr. Ross frankly discusses one of his own mistakes as being due to a personal repression. He by no means slavishly follows Freud, but insists that this author has paid too little attention to current events, as motive power in the unconscious.

The chapter on transference could be read with advantage by every physician, particularly those on the threshold of a career. In Dr. Ross's own words:

> This phenomenon of a patient liking a doctor is a thing that has been much talked of in psycho-analysis under the term Transference; a name which needs some explanation. This will be given presently. As has been said, however, it is not a phenomenon which has anything to do with psycho-analytic practice specially. No general practitioner remains for long a help to his patients, nor does he indeed for long remain their doctor unless they like him. This is the secret that has puzzled many clever doctors; how is it that so-and-so who is a stupid man not only retains his patients but obviously does them so much good?—because they like him.

If the primary object of the physician or surgeon is to help the patient, then he should study the art of transference, not as theoretic abstraction, but as the most practical weapon in his armoury.

The author does not believe in fixed symbolism in dreams, and unless the meaning of the dream is very plain, he adopts the safe plan of not trying to force an interpretation lest the patient be started on the wrong road. How often the neurotic will agree in order to please the doctor.

Several sex problems are discussed. The author quotes Malinowsky on the life of the Trobriand islanders to refute Freud's version of the Œdipus complex. These people do not regard cohabitation as producing pregnancy, and therefore the husband is merely a friend of the mother,

[1] "Recent Advances in Pathology", by G. Hadfield, M.D., F.R.C.P., and L. P. Garrod; 1932. London: J. and A. Churchill. Demy 8vo., pp. 402, with 67 illustrations. Price: 15s. net.

whose brother is the next of kin. Since the complex is not found in this race, authority, not sex, appears to be the motive force. Concerning homosexuality, the author quotes at length an extremely interesting case in which an apparently true invert was found to have been conditioned in boyhood. Idly and innocently unbuttoning a girl's blouse, he was discovered by the mother, who treated it as a heinous sin. A grand repression produced henceforth a complete disinterest in women. Subsequent to its release through psychological discussion, he lived a normal heterosexual life.

The concluding chapters deal with the study of an individual case, the dangers of analytic investigation and technique. Dr. Ross does not believe in a psychonanalysis of self as a prelude to work as a psychiatrist. He insists on a good training in general medicine as being an essential aid. Psychoanalysis in true psychotics and middle aged people is regarded as dangerous. The first interviews are designed merely to make the patient regard the doctor as a friend, and controversial topics, such as sex, are almost totally ignored. Copious note-taking is to be deprecated as tending to destroy confidence: the patient fears lest they should fall into wrong hands.

Enough has been written to show how extremely practical this book is. We hope that it will have the popularity it deserves.

LECTURES ON MEDICAL HISTORY.

DR. HENRY E. SIGERIST, Professor of the History of Medicine at the University of Leipzig, recently delivered a series of lectures to the students of the Johns Hopkins University, Baltimore, and elsewhere in the United States of America. The substance of these was embodied in a German volume which attracted so much interest that an English translation was speedily called for; this has now been published under the title: "Man and Medicine: An Introduction to Medical Knowledge."[1]

Dr. Sigerist's primary object was to give students entering on the study of medicine a general idea of the real nature and meaning of the profession that they were embracing. Throughout the book he uses the historical method of approach to his subject. He begins by showing the slow and painful steps by which man came to a knowledge of his own structure and of the functions of his various organs and how the introduction of the quantitive method by Harvey made a knowledge of physics and chemistry necessary to the physician. The development of knowledge of comparative anatomy and of experimental medicine showed that man was an animal among animals, and made biology also a necessary subject of study.. But the very success of these somewhat mechanistic methods diverted attention from man as an individual with a mind and spirit and thus something more than a bundle of machines subject to derangement. Therefore psychology, above all, must not be neglected—a fact which is not yet sufficiently appreciated by framers of medical curricula. He then discusses the varying attitudes of men towards the sick through the ages and with much sympathy and insight reveals the mental processes of the sick and insists on the need of a recognition of these.

Disease is next taken up in great detail, its signs, nature and causes and the development of theories regarding it. The next section deals with the actual work of the doctor in diagnosis and treatment, and after an arresting account of the growth of hygiene in theory and practice, in which due credit is paid to British pioneers, stress is laid on the part played by the medical practitioner in the prevention of disease. Here also the merits and demerits of national insurance against disease are reviewed. The book closes with a valuable discussion of the physician himself, his own ethics and his position in society. The relations of general practitioners and specialists receive due notice, and the Hippocratic oath is quoted in a full translation.

The book is full of practical wisdom and vividly portrays the mental and moral attributes that every doctor should strive to attain if his mission in life is to be truly successful. No medical student should fail to read it, both at the beginning of his course and again on his entrance to his clinical studies. It is also of deep interest to qualified practitioners and to educated laymen, though some of the former may find the sections on disease somewhat too detailed.

Dr. Sigerist displays a profound knowledge of medical history, but this is disguised by his informal conversational style, which makes his book delightful to read. The proof-reading has been carelessly done, and many of the Greek words are wrongly spelt. There is an introduction by Dr. William H. Welch.

[1] "Man and Medicine: An Introduction to Medical Knowledge", by H. E. Sigerist, with an introduction by W. H. Welch; 1932. London: George Allen and Unwin, Limited. Demy 8vo., pp. 350. Price: 12s. 6d. net.

GENITO-URINARY DISEASE IN THE FEMALE.

THE latest addition to the growing number of urological text books is "Urology in Women", by E. Catherine Lewis.[1] This little book is not a complete treatise on urology. Its aim is rather to supplement the standard works on the subject by dealing with those disorders which occur only in the female sex and by emphasizing certain points in genito-urinary disease in general which have a particular application in women patients.

The author has achieved her object. The urethra, bladder, ureter and kidney are dealt with in turn, each section commencing with a short description of the important anatomical features of the part in the female, after which the various disorders are discussed in a concise and practical manner. The only faults are minor ones of omission, with none of commission.

Hunner's ulcer receives but passing mention, and a short account of its characteristic clinical syndrome might with advantage have been included, while the condition of bullous œdema of the vesical neck, so common in the presence of urethral obstruction, is also rather briefly dismissed. A surprising omission is any account of nephroptosis, which is almost peculiar to the female sex.

We can find no other fault with the book. The teaching is uniformly sound, the illustrations are good, the contents are very readable. We congratulate the author on satisfying a very definite want and thoroughly recommend the book.

[1] "Urology in Women: A Handbook of Urinary Diseases in the Female Sex", by E. C. Lewis, M.S., F.R.C.S.; 1932. London: Baillière, Tindall and Cox. Crown 4to., pp. 94, with illustrations. Price: 6s. net.

A MANUAL OF PÆDIATRICS.

DR. DONALD PATERSON is known to a large number of medical men through his part authorship of "Modern Methods of Feeding in Infancy and Childhood" (Paterson and Forest-Smith, now in its third edition) and "Diseases of Children" (Garrod, Batten, Thursfield and Paterson).

His book, "Sick Children: Diagnosis and Treatment", deals with the commoner diseases of childhood and is obviously intended for the use of the student and general practitioner.[2] It is well written, thoroughly practical and up to date, for the author has gathered information far and wide from current medical literature and also has given the results of his own observations and experiences. There are many prescriptions, diet lists and useful hints on diagnosis and treatment. There are numerous illustrations, which are well reproduced and bring out splendidly the characteristics they were intended to feature.

The parts of the book which appear most useful are those dealing with diseases of the nervous system and the feeding of the normal infant and child; but the whole of the book is good.

No person who has to deal with the sick child, whether specialist or general practitioner, can afford to be without it.

[2] "Sick Children: Diagnosis and Treatment. A Manual for Students and Practitioners", by Donald Paterson, B.A., M.D., F.R.C.P.; 1930. London: Cassell and Company Limited; Sydney: Angus and Robertson. Crown 8vo., pp. 538, with sixteen half-tone plates and eighty-five figures in the text.

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MEDICAL PRACTITIONERS AND PUBLIC LIFE.

NON-MEDICAL people often say that a medical man can talk nothing but "shop". When a young man makes up his mind to study medicine, he finds that he has to be whole hearted in his efforts. As a rule, he goes straight from school to the university; he eschews the arts school and that of pure science and enrols himself as a student in the faculty of medicine. The medical curriculum is so long that, even had he the desire to learn something of letters, the prospect of adding three years to his university course appals him. Once he has graduated, he settles down to practice, and he sets before himself either the goal of a specialty or that of proficiency as a general practitioner. Medical practitioners naturally spend most of their energies on their medical work. The medical practitioner who has no interest beyond clinical medicine and its branches, will be a dull fellow. He will be able to talk nothing but "shop". A great deal might be written about the need for relaxation, the indulgence of a hobby or the cultivation of the arts. These affect the medical practitioner as an individual. It is to the medical practitioner as a member of the body politic that attention should be turned.

Readers of this journal have had thrust upon them many views of the future of medicine as a profession. Life is becoming more and more strenuous, and it is not as easy as it was to make a living. We do not propose to discuss the future of medicine, to count the number of practitioners in any particular area, to refer to the narrowing of the field of private practice or to deplore the whittling away of fees. Life for a medical practitioner holds many opportunities not only of success measured in terms of pounds, shillings and pence, but of service to humanity and of attaining a satisfaction that comes from a knowledge of duty done. The difficulty very often is to discover the path of duty. There is a duty which individual practitioners owe to the community, and there is a duty owing by the profession as a corporate body. This second duty is generally forgotten.

Surprise was expressed recently by some of our correspondents on the publication in this journal of a letter from a Victorian practitioner on the economic situation. There was nothing improper about the publication of the letter in question. Medical practitioners are, like all other members of the community, interested in the economic situation. Without expressing any opinion on the views of our correspondents on this subject, we may point out that nothing but good can come from such a discussion. The medical profession as such does not take sufficient interest in the affairs of the country. It has become a commonplace to abuse politicians as place seekers, as desirous of power for its own sake, and even to accuse them of wishing to feather their own nests. In some instances the abuse may be deserved, but it is easy to give a dog a bad name. We refuse to believe that more than a small proportion of Australia's too numerous parliamentarians, of its mayors, shire councillors, aldermen and so forth have sought office from ulterior motives. There have been medical practitioners who have served the State in parliament and council, and some are still serving with distinction. But medicine as a profession has done little. Medicine has something apart from its treatment of disease to give to the State. Numbers of the legislative acts of the State are related directly and indirectly to

the public health, and the training of a medical practitioner will make him better qualified than a non-medical person to express an opinion in such matters. Many public positions could with advantage to the community be held by medical practitioners. For example, ever and anon a plaint is raised that a minister of health or a coroner should be a medical practitioner. Unfortunately, the leaders of the profession and those qualified to hold office have not come forward. We can imagine that in a well organized state the medical profession would choose some of its members and train them before they sought election to office that the state might be served. It would not do to leave candidature to a Gilbertian Strephon, for then the exquisite satire of "Iolanthe" would be justified. A proposal has been brought forward by the Queensland Branch of the British Medical Association that some body analogous to the Representative Body of the British Medical Association in England, should be instituted in Australia. Whether this proposal can be carried into effect may be doubtful, but it must not be cast on one side without careful consideration. It is not unlikely that such a body might be the means of bringing to the service of the State men trained in medicine who were able and who might be prevailed upon to serve.

Current Comment.

THE ACTION OF DIGITALIS ON CORONARY FLOW.

SINCE the introduction of digitalis, one of the most valuable drugs in the whole range of the Pharmacopœia, its exact action has been a matter of great interest and importance and the subject of much experimental work. Its indications and action in auricular fibrillation are almost too well known to warrant special mention, but there still remain many conditions in which the physician wonders whether he is doing good or harm by its use, or merely wasting a valuable substance. There was once, of course, the old fashioned rule-of-thumb practitioner who in all cases of doubt added a little tincture of digitalis to his prescription, just, as he naïvely explained, to strengthen the heart. There has been, and still is, the advocate of relatively large doses of the drug in cases of severe systemic infection. The propriety of the administration of digitalis has also been inquired into where a state of heart-block exists. On the whole it will be conceded that there are few, if any, clinicians today who would limit their use of this drug to frank instances of irregularity associated with fibrillation and cardiac failure. Therefore, the more we can know as to the pharmacological action of this substance, the surer our scientific ground for administering it on the one hand or withholding it on the other. In auricular fibrillation with the usual signs of congestive failure there are more or less exact therapeutic criteria available, for the alterations in minute volume and regulation of œdema can be clinically assessed. Coronary flow, however, is, to the bedside observer, a more intangible thing, and he must look to the experimentalist for any accurate information.

N. C. Gilbert and G. K. Fenn have tackled this problem and have endeavoured to adduce evidence of alterations in the coronary arterial calibre as the result of administering digitalis.[1] They summarize the experimental methods that have been hitherto employed. These are the employing of arterial strips, the use of the isolated heart, the heart-lung preparation, and of the so-called "intact" animal. The arterial strip preparations have shown a definite contraction with a much weaker dilution of digitalis in the case of the coronary vessels than in that of the systemic arteries. Similar evidence has been afforded in the more elaborate preparations, but Cushny's statement must be remembered, that the variations in the action of the heart are so frequent under experimental conditions that conclusions must be made with caution. The present authors have worked with the anæsthetized dog. A piston recorder operating on a revolving drum is attached to a cannula placed in the coronary sinus through the right auricular appendage, and the blood is returned to the femoral vein. Many control experiments were performed in order to eliminate changes due to experimental variation. The digitalis used was one of several commercial preparations of high grade, standardized in cat units. One-tenth of a minimum lethal dose was perfused every ten or even seven minutes until death of the animal occurred. The lethal dose used was one and a quarter cat units or one cat unit, the former being found to be too high in most cases.

The conclusions arrived at were that digitalis can decrease coronary flow under conditions of pulse rate and blood pressure which normally would tend to increase coronary flow. Of course, it was not possible to control the blood pressure and make it a constant factor. But the authors consider that it is possible that a decrease in the coronary flow occurred sometimes when the animal's pulse rate and blood pressure fell. Obviously this is not to the biological advantage of the animal, and it is pointed out that it must not be expected that it occurs in all experimental or clinical cases. Clinicians are well aware of the multiplicity of reflex influences that confuse the issue in the human subject. Gilbert and Fenn state that angina probably includes a large group of cases of coronary vaso-constriction, due to widely distributed reflex

[1] *Archives of Internal Medicine*, November, 1932.

causation, and that in order to produce so disadvantageous a mechanism the autonomic system must be over-labile and have a lowered threshold to stimulation. Probably, they maintain, it is in cases of this nature that a vaso-constrictor action on the coronary arteries may most readily be obtained.

Finally, they conclude that digitalis may exert a vaso-constrictor effect on the coronary arteries and that some caution is advisable in the use of the drug in patients suffering from coronary disease. To the physician there are two interesting points in this work. First, the general trend of experimental work seems to bear out the contention that digitalis may constrict the coronary arteries. Secondly, there is evidence that it is virtually or perhaps entirely impossible to perform animal experiments under the rigid conditions of a physical or chemical research. The experimenter is faced with subtle and confusing variation of organic function. He may be forced back in the end upon a certain degree of philosophical speculation, where perhaps his clinical brother sympathetically meets him upon common ground. The annals of medicine are full of experimental work afterwards proved to be incomplete or erroneous. While no adverse criticism is levelled at this useful piece of work, it may be pointed out that neither by the bench nor by the bedside can we be dogmatic. Nor can we transfer *in toto* to the patient the conclusions of the laboratory. The physician most to be admired will always be he who, while backed with a thorough knowledge of the experimental studies of function, yet keeps his mind open to that play of individual variation of mind and body that makes clinical medicine perhaps unscientific, but none the less fascinating.

GEE'S DISEASE.

In 1888 Samuel Gee described a disease that he named "the cœliac affection". This disease is characterized by emaciation, weakness, anæmia, abdominal distension, the passage of pale, bulky, offensive stools, chronicity, a tendency to relapse, stunting of growth *et cetera*. Gee noted a striking resemblance to sprue. He also remarked that, though children were most liable to the disease, persons of all ages were affected. In 1889 Gibbons drew further attention to the disease. Very little appeared in the literature from that time until 1908, when Herter gave an excellent description of "Infantilism and Chronic Intestinal Infection". Herter showed that the stools were largely composed of fat and that there was inadequate absorption of fat and calcium. Since the appearance of Herter's publication, cœliac disease of children has become a readily recognizable disorder. An essentially similar disease of adults is not so well known; it has often been termed "non-tropical sprue". In a recent communication T. Izod Bennett, Donald Hunter and Janet M. Vaughan express the opinion that non-tropical sprue is the same as the disease described by Gee, that it is essentially different from true sprue, and that it may occur in adolescence, adult life or even old age.[1] These observers remark that the disease presents many striking manifestations apart from those pointed out by Gee; tetany, rickets, osteomalacia, anæmias of various kinds, and megacolon may occur. They apply to it the term "idiopathic steatorrhœa"—an unhappy title and itself a confession of ignorance, for it is merely the name of an outstanding symptom.

They studied in all fifteen patients, of whom the youngest was aged fifteen years and the oldest fifty-eight years. In eleven cases the disease commenced in infancy or at some period up to the age of three and a half years; in three cases, from ten to thirteen years, and in one case at fifty-two years. In some instances there had been a latent period after the subsidence of symptoms in early childhood, until adult age was reached.

Steatorrhœa and excessive calcium loss were features of every case. In no instance was the skeleton normal; pronounced deformities, such as *genu valgum*, *genu varum*, bending of long bones, bossing of bones *et cetera*, were common. Osteoporosis was observed in thirteen cases. Ten of the patients were dwarfed; but dwarfism was not necessarily accompanied by sexual infantilism or retardation of mental development. Severe rickets was noted in several cases. Five of the patients suffered from glossitis; but only two of twelve examined were achlorhydric. Tetany was a common symptom. Of thirteen patients examined with a slit lamp, six were found to have opacities of the lens. In three cases the blood appeared to be normal; in the remainder there was hypochromic anæmia, hyperchromic macrocytic anæmia or erythroblastic anæmia. The patients affected with macrocytic anæmia responded to treatment by "Marmite" (autolysed yeast), the others to large doses of iron. Many disturbances of metabolism were observed. For example, it was noted that the blood sugar content increased very little after the ingestion of glucose; apparently the absorption of glucose was abnormally slow.

Bennett, Hunter and Vaughan advance several strong arguments, some of which are obvious from a consideration of their findings mentioned above, against the view that so-called "non-tropical sprue" and tropical sprue are the same disease. They believe that Gee's disease is "a nutritional disturbance of gastro-intestinal origin dependent upon disturbance of function in spite of the absence of anatomical lesions". Nothing can be done to remedy the defect in the alimentary tract; treatment must be directed towards minimizing the consequences of the defect, by the administration of a suitable diet, calcium, vitamin *D*, iron *et cetera*. Cure is impracticable; but great alleviation of symptoms may result from the employment of these measures.

This is a long and carefully prepared paper containing much valuable information apart from the description of Gee's disease. It is worthy of consideration by every medical practitioner.

[1] *The Quarterly Journal of Medicine*, October, 1932.

Abstracts from Current Medical Literature.

SURGERY.

Pneumococcal Meningitis.

ALLISON T. WANAMAKER (*The Western Journal of Surgery, Obstetrics and Gynecology*, August, 1932) reports a case of acute meningitis with apparent cure, with death occurring five years later from pneumococcal infection of the peritoneum and meninges. The author notes two points of interest: (i) The recovery from acute meningitis, and (ii) death from plastic meningitis after a period of five years' health. When eight years of age, the patient had discharge from both ears; that from the right was of short duration, that from the left continued for several weeks; and when the patient was first seen by the author, acute mastoiditis was diagnosed. Examination of the spinal fluid revealed a cell count of 2,800. Operation was performed on both mastoids on the same day. A culture from the left mastoid yielded a Gram-positive diplococcus. For two days her condition improved; it then became greatly aggravated; a craniotomy was done over the left middle fossa and an incision was made into the left dura. She was kept under observation for four months and then discharged from hospital as cured. On two occasions during the next five years she had a discharge from the left ear, then she developed earache and sore throat. The patient rapidly became unconscious; the left drum was congested and the wound was bulging. Three days later she had neck rigidity and a positive Babinski sign. On this date the diagnosis of probable brain abscess was made. One week later the patient died, and at autopsy an old chronic purulent osteomyelitis of the left mastoid was found. The infection could be traced along the eighth nerve to the internal carotid artery and then to the posterior fossa. The infection was due to a pneumococcus. A cerebellar abscess was present.

Peptic Ulcer and Gastric Carcinoma.

WILFRED D. NEWCOMBE (*The British Journal of Surgery*, October, 1932) discusses the relation between peptic ulceration and gastric carcinoma. Apparently Rokitansky (1842) was the first to state that cancer might arise from a simple ulcer. In his historical survey the author shows how popular opinion has favoured, first, the belief that ulceration of primary carcinoma is the more common, and then, conversely, that most cases of carcinoma arise in preexisting peptic ulcer. In the present day, members of Aschoff's school are the chief exponents of the former view, whilst the morbid anatomists of the Mayo Clinic have frequently expressed the opinion that the majority of stomach cancers arise from preexisting ulcers. The size of any given ulcer has nothing to do with any malignant condition. The largest ever seen by the author measured 9·5 by 5·5 centimetres. The author outlines the criteria for the diagnosis of the preexistence of simple ulcer. There is a complete destruction of an area of muscle approximately the size of the floor of the ulcer. There is present an area of fibrous and granulating tissue in its floor. The surrounding blood vessels are affected with endarteritis. There is also fusion for close approximation between the *muscularis mucosæ* and the muscularis. This latter is a matter of great importance and was present in 98·8% of the peptic ulcers in this series. In discussing the criteria for the diagnosis, the author stresses the fact that included areas of epithelium furnish no evidence for carcinoma. In the author's series, after applying these criteria, he finds six cases which are definite carcinoma arising in preexisting ulcer. While admitting that a long history may help in the clinical diagnosis, the author mentions nine cases of primary carcinoma with histories extending over three years. "It is wrong to assume that a case of gastric carcinoma arose in an ulcer merely because it has a long history." As regards sex, the author's figures would suggest a greater frequency of ulcer-cancer in the male. The author mentions the wide variation in figures given by various writers concerning the frequency of ulcer-cancer, and thinks that it is due to lack of definite criteria on which to base the diagnosis of ulcer-cancer. For instance, some figures are based on clinical examinations, some on radiological, some on histories, and but few on morbid anatomy. Ewing concluded that cancerous change does not take place in more than 5% of ulcers. Carcinoma may occur in a stomach already the seat of chronic ulcer. After applying his criteria to this series, the author finds that 3·75% of ulcers showed malignant change and 13% of the cancers showed evidence of previous peptic ulceration.

The Determination of Operability in Exophthalmic Goitre.

LINDON SEED (*The Western Journal of Surgery, Obstetrics and Gynecology*, November, 1932) writes about the determination of operability in exophthalmic goitre. Assuming that judgement and technique are perfect, and that the patient presents himself for operation before the disease is too far advanced, the mortality following thyreoidectomy should be practically nil. The unavoidable mortality rate is about 0·5%. The causes of deaths over that figure are nearly all avoidable and are about equally divided between errors in judgement and errors in technique. An exophthalmic goitre patient can be considered "a safe risk" for operation: if he has received sufficient iodine; if the weight loss is not excessive; if there has been no recent weight loss, and particularly if there has been a gain in weight of even a few pounds; if his strength is sufficient for him to step up on a chair; if the basal metabolic rate is below +75%; if he has no œdema or ascites and can walk a block without becoming short of breath; if he is able to be out of bed from three to four hours a day; if he is sleeping well and eating well; if the disease has not been present for many years; if the patient is neither very old nor very young; if there are no other complicating diseases.

Teno-Synovitis of the Foot.

W. ABERLE-HORSTENEGG (*Münchener Medizinische Wochenschrift*, June 10, 1932) refers to a cause of painful foot which may not be always recognized. He gives the detailed histories of three cases in which the distal portion of the tendon of the *peroneus longus* was involved. The outstanding symptom was pain on the outer aspect of the foot, which was localized to the region of the cuboid bone. Radiographic examination revealed no abnormality. The apparent cause was some form of trauma—chronic in two cases, due to long periods of standing at work, and to roller skating in the third instance. In none of them was there any history of antecedent inflammatory conditions. The treatment comprised rest combined with massage and the use of an ointment such as *Unguentum cinereum*. Diathermy was useful in two instances and a failure in the third.

Thoracoplasty.

KREMER (*Deutsche Medizinische Wochenschrift*, September 2, 1932) states that in performing thoracoplasty one must always consider whether one wishes to obtain a diminution or a complete cessation of lung movement. A typical Sauerbruch operation produces only the former, but in an operation to produce the latter and thus leave no "dead space" in the thorax, it is necessary to remove the angular curves of the ribs also. If big cavities lie close to the anterior ends of the ribs, these ends must be resected. If cavities lie in the upper part of the lung, the lower part of the lung being healthy, then a thoracoplasty involving the first to the seventh ribs and completely immobilizing the upper lobe of the lung *plus* phrenicotomy will lead to a permanent healing.

Calcareous Deposits in the Supraspinatus Tendon.

SHADOWS overlying the greater tuberosity of the humerus in skiagrams have been recognized since 1907. Two patients showing such shadows were operated on by Painter at that time and the masses causing the shadows were found to consist of a cheesy, calcareous material, which he thought was contained in the subdeltoid bursa. R. C. Elmslie (*The British Journal of Surgery*, October, 1932) reports eight cases; seven of the patients came to operation and were almost completely relieved thereby. When the condition has an

acute onset the pain may be very severe. There is a point of maximum tenderness over the greater tuberosity. There is some limitation of movement. The shadow may be taken for a loose body in the shoulder joint. The removal of the calcareous matter gives the quickest relief from pain, and the best method of approach is along the anterior margin of the deltoid. The histological appearance of the material varies with the chronicity. Calcareous deposit is seen amongst inflammatory cells, including some foreign-body giant cells. Fibrous tissue in various stages of development is seen in the surrounding walls. There is no indication of the condition being tuberculous. The calcareous matter has been analysed and found to consist of calcium stearate and calcium oxalate. The author suggests that these deposits occur in effused blood following upon a tear of the insertion of the supraspinatus muscle.

Post-Operative Hernia.

R. W. McNEALY AND MANUEL E. LICHTENSTEIN (*The American Journal of Surgery*, October, 1932) discuss post-operative hernia. The occurrence of a post-operative ventral hernia creates a pathological condition which in many instances is more formidable than the condition for which the primary operation was performed. The authors have interested themselves in the experimental production of post-operative herniæ in laboratory animals, hoping by this study to obtain information that would be of assistance in evaluating the factors responsible for the occurrence of post-operative herniations in clinical work. Increased intermittent intraabdominal pressure, such as is caused by coughing, vomiting or straining in defæcation or urination is likely to result in loosening or tearing out of stitches or the forcing of omentum or fat between the approximated layers. The continuous presence of increased intra-abdominal pressure such as occurs in paralytic ileus or incomplete obstruction may also tend to produce the same accidents as occur in the intermittent form, and in addition such prolonged distension renders the parietes ischæmic, and this ischæmia delays the healing process. In some instances excessive tension results from an attempt to bridge too wide a defect with insufficient tissue. The following deductions may be made. Post-operative herniations of the anterior abdominal wall are due to one or several of the following causes: excessive tension on the suture line, malocclusion of the incised layers of the abdominal wall, perforation of the wall by fat or omental tags, infection of the fascia with subsequent sloughing, muscle injury or paralysis, systemic conditions, such as diabetes, tuberculosis, syphilis and occasionally localized carcinomatous infiltration. The transversalis fascia and the transversus muscle play an important rôle in maintaining, when intact, the integrity of the anterior abdominal wall. Accurate approximation of like structures is conducive to firm union. The intelligent application of abdominal binders and adhesive tape to the abdomen following closure of an abdominal wound in a manner to relieve the tension on the suture line assists in securing firm union.

Acute Appendicitis.

G. H. COLT AND MARGARET M. MORRISON (*The British Journal of Surgery*, October, 1932) give a detailed analysis of the mortality in acute appendicitis, with respect to drainage and the variety of operations. In discussing the methods of approach, the authors conclude that the shortest and simplest route is invariably the best. With a paracentral incision there is a distinct risk in spreading infection. A statistical analysis of 1,408 cases of acute appendicitis did not justify any conclusion concerning the advisability of drainage of the peritoneal cavity. The authors state that the lowest mortality was found to occur with the Battle incision. In dealing with a median or pelvic appendicitis, however, a paramedian incision is preferable.

The Viability of Strangulated Intestinal Loops.

LAWRENCE JACQUES, W. A. DROEGE-MUELLER, AND J. R. BUCHBINDER (*Surgery, Gynecology and Obstetrics*, November, 1932) discuss the viability of strangulated intestinal loops. In severe strangulation the problem of their proper surgical treatment is often a matter of doubt. A difficult phase of that problem is the accurate estimation of the degree of damage sustained by the strangulated bowel. The practice of exteriorizing doubtful loops has perhaps diminished the need for an accurate decision on this point. Nevertheless, exteriorization is not always feasible, particularly when very large segments of bowel have been involved; nor is it in itself an indifferent procedure. The morbidity and mortality resulting from the exteriorization of damaged loops which might safely have been returned to the abdomen, are sufficiently great to justify a search for means to avoid this step when possible. In a group of experiments on dogs an attempt was made to establish more satisfactory criteria than those now available for the viability of strangulated intestinal loops. The results of a comparative study of various criteria are recorded. With increasing experience a considerable degree of accuracy was attained on the basis of gross pathological characteristics. Of these, the consistency of the strangulated intestine and the return of colour after release of the obstruction were of most value, while the mesenteric pulsations, odour, and the amount and character of the exudate present were misleading. The absence of pulsations over the mesenteric arteries could not be accepted as evidence of the occlusion of these vessels. Of the special tests performed, the demonstration of contractility to faradic stimulation was regarded as the most significant, while bacterial smears, surface temperature observations over the mesenteric vessels, the bleeding resulting from pricking, and the blanching reaction to pituitrin, appeared to have some corroborative value. The disturbance of intestinal circulation by distension which has previously been demonstrated, was confirmed by surface temperature studies. Within the limits of the technique used, these experiments do not support the view that actual necrosis of strangulated bowel wall is necessary to permit the passage of bacteria.

Progressive Exophthalmos after Thyreoidectomy.

HOWARD C. NEFFZIGER (*The Western Journal of Surgery, Obstetrics and Gynecology*, October, 1932) reviews the present status of a condition which is very likely to result in total blindness and which has been referred to as "malignant exophthalmos". Even after the excision of a goitre the exophthalmos is progressive. The author's first patient was blind because of corneal ulceration, and later committed suicide. The second patient was a nurse who had undergone thyreoidectomy two years previously. Both eyes were equally prominent, the eyelids were puffy, the movements of the eyes were diminished in all directions, blindness was almost complete, optic atrophy was present. At operation it was decided to remove the orbital roof. When the retrobulbar space was opened, no veins or fat were found; the entire space was filled with hypertrophied extraocular muscles. The reason for the exophthalmos was thought to lie in the increased bulk of muscle. It was decided to remove the margin of the optic foramen. After operation the range of movements of the eye gradually increased, offering a contrast to the untreated eye. At the end of the first week vision commenced to return. In a short time the patient could read advertisements or letters. Prior to operation she had not been able to distinguish a person at a distance of six feet. The results of microscopic examination of the extraocular muscles on both sides were identical and revealed round cell infiltration, marked œdema, destruction of the muscle fibres and complete loss of muscle architecture, with increase in fibroblasts and generalized fibrosis. The results of the second operation were similar to those of the first. At the time of writing the patient has regained excellent vision, despite some degree of optic atrophy. The author goes on to state that his series of similar patients now numbers six. He then outlines many of the theories advanced to explain exophthalmos. There have been no deaths in this series. The recession of the globes continues over many months; in no case has there been any tendency to recurrence. In concluding, the author states that very little morbid anatomical research has been conducted on the orbits of patients who have died with exophthalmos.

Special Articles on Treatment.

(Contributed by request.)

IV.

TREATMENT OF DIPHTHERIA.

FEW, if any, striking advances have been made in the treatment of diphtheria during the last twenty years. A great deal of valuable knowledge, however, has been accumulated piecemeal. Antitoxin dosage can now be regulated more intelligently; as a corollary the prognosis as to life or death can be estimated with great accuracy; the duration of necessary rest in bed and the time limit of dangerous after-effects can be fairly definitely fixed for any individual patient. Recovery should occur in all but very acute fulminating or neglected cases, and no late toxic effects of any kind whatever should ensue in any child treated reasonably early and reasonably efficiently.

Progress is being made at last in the treatment of persistent and prolonged infection following an attack, and we now at least know the *sine qua non* of its prevention, the prevention and, if necessary, the active treatment of unhealthy conditions of the nose and throat.

In this paper it is proposed to set down, in brief and dogmatic fashion, advice in matters of detail, it being assumed that every practitioner is familiar with the clinical appearances of the various types and of the general principles of treatment.

Serum Therapy.

Methods of Administration.

Subcutaneous injection should be abolished. It is just as painful as intramuscular injection and absorption is slower. The intramuscular route should be employed in all cases, mild and severe. The buttock and the outer part of the thigh are suitable sites, and with massive doses it will be necessary to make several injections. In certain cases serum should be given intravenously as well. They are of: (*a*) very rapidly progressing laryngeal diphtheria in young children, especially in those where obstruction is great and membrane has not yet formed in the larynx and trachea. In cases of slower progression and where membrane is obviously present, intravenous injection is not so necessary, though desirable. The introduction is certain to be difficult and may be impossible; if so, one must be satisfied with the intramuscular route. (*b*) Older children and adults with early fulminating diphtheria, shown by the rapid development of pearly membrane, great œdema, early tendency to bull neck, intense prostration, giddiness and weakness, and generally high fever early. I do not advise the intravenous method in neglected cases of severe diphtheria of, say, four or five days' duration. In all cases a large amount should be given intramuscularly as well.

Dosage.

The following amounts are considered sufficient, but are arrived at quite arbitrarily, and may be doubled if expense is not a consideration. Halving them is not recommended.

1. Prophylactic: 500 to 1,000 units.
2. Carriers (chronic tonsillar or nasal infections): 1,000 to 4,000 units.
3. Mild tonsillar diphtheria:
   (*a*) Early, with rise of temperature and definite malaise, 4,000 to 10,000 units.
   (*b*) Early, without malaise, 4,000 units.
   (*c*) Late, without malaise, 4,000 units.
4. Moderately severe tonsillar diphtheria. Membrane covering tonsils at end of two days:
   (*a*) With toxic symptoms, palpable cervical glands *et cetera*, 10,000 to 20,000 units.
   (*b*) Without toxic symptoms or notable malaise, 8,000 units.
5. Acute (severe) diphtheria:
   (*a*) Early, with no encroachment on palate or cervical swelling, but spreading pearly membrane and œdema of fauces, 30,000 to 40,000 units intramuscularly, or 20,000 units intravenously and 20,000 units intramuscularly.
   (*b*) Second to third day with membrane over palate, bull neck and nasal involvement, 30,000 to 60,000 units intramuscularly and 30,000 units intravenously.
6. Neglected diphtheria, with bull neck, old membrane, foul odour, nasal discharge foul or blood-stained, 40,000 to 60,000 units intramuscularly. No great immediate result is to be expected, and as a rule no extra benefit is got by repeated or larger doses.
7. Laryngeal diphtheria (if there is no great faucial involvement):
   (*a*) If it is considered that there is no likelihood of necessity for operation, 8,000 to 12,000 units.
   (*b*) If symptoms are pronounced and operation likely, under four years, 30,000 units intramuscularly and 30,000 intravenously; over four years, 20,000 units intramuscularly and 20,000 intravenously.

Observation of Effects of Serum Injection and Question of Repeating It.

1. In mild and moderately severe cases (classes 3 and 4) inspection should be made within sixteen hours. The membrane should either have cleared, be clearing, or have been checked. (*a*) If cleared or clearing, no more antitoxin will be needed. (*b*) If checked and the child looks and feels well, inspect again in another twelve hours. (*c*) If checked and the temperature is still elevated, and there is still malaise which cannot be otherwise accounted for (for example, coccal infection, constipation *et cetera*), the original dose should be repeated at once. (*d*) If the membrane is now spreading, and especially if it is accompanied by œdema of the palate or swelling of the tissues of the neck, a large dose should be given, preferably intravenously.

2. In severe cases (class 5), if no competent and experienced nurse is present, inspection should be made at the end of six or eight hours. Otherwise the nurse should report any signs of extension, especially naso-pharyngeal obstruction or cervical swelling, and if no report is made, you should visit the patient in not less than twelve hours. If he is worse, a large amount of antitoxin, 30,000 to 60,000 units, should be given then. If his condition has improved, he should be visited again in a few hours. If his condition is unchanged at the end of the first twelve hours, very careful notes should be made, and at the end of another four or six hours, unless there is improvement, a second injection should be made. All of your antitoxin treatment should be completed within thirty or at the most thirty-six hours. Any patient requiring antitoxin on the third day of treatment has been maltreated.

No rules can be laid down concerning "redosage" in laryngeal cases. The issue as to whether operation is to be avoided or not is usually decided within sixteen hours. If in the meantime the symptoms are found to be increasing, antitoxin injection should be repeated at once, especially if the patient is a young, small child. Every hour counts in such cases. Once operation is found to be inevitable, there is no particular object in flooding the system with antitoxin, as the patients are not toxic, and it is only the local condition that is of importance.

Period of Rest in Bed.

In all mild and moderate cases the patient, if he has reacted satisfactorily to antitoxin treatment, will be well by the third or fourth day, in many cases earlier. He may safely sit up in bed in from eight to twelve days, and after a further period of two days, if the heart action is normal, he may sit out. If, however, the early results have been unsatisfactory, if antitoxin injection has had to be repeated, if membrane has been very extensive, or illness and appearances of toxæmia have persisted unduly long, great care is necessary. Bad signs during the first week or so, such as evidences of myocarditis, vasomotor

failure or cardiac palsy, renal damage, hæmorrhage *et cetera*, will, of course, give warning, but, provided none of these occur, careful watch must be kept for cardiac irregularity, gallop rhythm, heart block and palatal paralysis during the period from the tenth to the twentieth day. Pronounced pallor, lassitude, vomiting, and a progressive fall in blood pressure direct attention to the danger.

If no such signs or symptoms have occurred, the patient may be given higher pillows about the twenty-fourth day, and thereafter very gradually raised to the sitting-up position and generally allowed out of bed about the thirtieth day. Persistent tachycardia is an indication to proceed very carefully.

If, on the other hand, the symptoms referred to have occurred, the patient should be kept recumbent till the heart condition is normal and till the danger of the late palsies (respiratory and pharyngeal) is over. This last may be taken to be about the end of the seventh week. I have never seen or known either of these fatal paralyses to appear later.

Local Treatment.

Unless the throat is to be douched, it is best to leave it alone. Painting, gargling and spraying are in my opinion useless. Any non-irritating fluid may be used for douching; hot normal saline solution is satisfactory, cleansing and soothing. A steady, forcible hosing of the tonsils and surrounding parts will clear up a dirty throat very quickly. If the nose is not obstructed, it should be left alone; if blocked with decaying membrane or thick muco-pus, it is best to douche it gently a few times. The mouth, teeth, tongue, gums and lips should be cleared frequently, any good wash, such as "Listerine" or "Glycothymoline", being used. The patient should be given clean air to breathe and clean water and clean milk to drink.

Diet.

In any ordinary moderate case of diphtheria, if treatment has been efficient, the patient will be able to swallow in comfort and the appetite will have returned by the third or fourth day. He may then go on full diet practically at once, and there is no need for any particular article of food to be withheld. In septic and neglected cases the throat may not clear for a week or more, and swallowing may be painful and difficult; such patients must be fed on common sense lines. In severe cases there is for weeks and weeks a period of low vitality, general atony and nervous instability; the patients lie flaccid in bed, and care must be taken to see that the diet is not of a constipating nature, while daily attention to the bowels is essential.

Streptodiphtheria.

The dreadful malignant form, though comparatively rare, is well known and has been described in text books for many years. Into this class come many of the cases reported as peculiarly non-responsive to diphtheria antitoxin, and which, when occurring in groups, scare the life out of the medical attendant. He promptly concludes that either there is something wrong with the antitoxin or that the illness is caused by a particular strain of diphtheria bacillus producing a toxin that the antitoxin will not neutralize. There is little or no evidence in favour of this latter contention. In these cases, characterized by rapidly spreading membrane, high fever, often delirium, and a tendency to ulceration and necrosis, scarlet fever antitoxin (30 to 50 cubic centimetres or more) should be given with the diphtheria antitoxin. The ordinary so-called antistreptococcal serum is useless.

In the less severe types, which usually occur like the severe types in debilitated or run-down persons, and in whom, with a pale throat, there are high fever, prostration, and spreading membrane, and when direct smear or early culture shows diphtheria bacilli and streptococci, both scarlet fever antitoxin and diphtheria antitoxin should be given.

In the ordinary cases of mixed infection, with a red, flaring, angry throat and diphtheria membrane, the use of scarlet fever antitoxin is optional. I would advise its administration in the severer ones, provided it can be given reasonably early.

Otitis media, cervical abscess and cellulitis, and occasionally septicæmia and pyæmia are recognized results of such mixed infection, but it also predisposes strongly to the so-called carrier state. Convalescents are apt to carry persistently or intermittently either streptococci or diphtheria bacilli, or both, and the course of the condition is apt to be punctuated by repeated mild exacerbations of infection and toxæmia.

The prevention of this state and, for that matter, of acute infection of the tonsils by diphtheria bacilli or streptococci lies, of course, in the prevention of the first original infection, which often occurs in infancy. How we are to do this I do not know. But early combined immunization at, say, twelve months, is on the face of it an obvious measure. Combined immunization of children aged five years will protect them as regards serious illness and danger to life, but it can hardly save them from the carrier state once the local damage has been done.

The Carrier State.

The treatment of the carrier state presents in many cases an almost hopeless problem. Simple tonsillectomy works wonders in children in whom infection is localized, and indeed it is the *sine qua non* in practically all cases. It does not matter much what else is done if tonsillectomy is omitted. But the tonsil is only a part, and both in children and adults the other tissues and surfaces of the pharynx, naso-pharynx, antra and nares may have been damaged and chronically or intermittently infected over a period of months or years. In these cases tonsillectomy combined with careful surgical and local treatment of the nose and adnexa is advised. The antra are not always affected, and sometimes all that is necessary is the clearing up of a small ulcerated patch on the septum or naso-pharynx.

F. V. SCHOLES, M.D., D.P.H.,
Medical Superintendent, Infectious Diseases Hospital, Fairfield, Victoria.

British Medical Association News.

MEDICO-POLITICAL.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on February 1, 1933, DR. W. G. D. UPJOHN, the President, in the chair.

Financial Statements.

DR. C. H. MOLLISON, the Honorary Treasurer, presented the statement of receipts and payments of the Victorian Branch of the British Medical Association and of the Medical Society of Victoria for the period January 15, 1932, to January 10, 1933. The statements, which are published herewith, were adopted (see page 230).

THE NORTH COAST MEDICAL ASSOCIATION, a local sub-branch of the Queensland Branch of the British Medical Association, was inaugurated at Nambour on November 26, 1932. Dr. E. S. Meyers, President, Dr. Kenneth Wilson, Honorary Secretary, and Dr. S. F. McDonald represented the Branch.

At a clinical meeting Dr. S. F. McDonald read a paper illustrated by cases on "Pyloric Stenosis and Intussusception". Dr. H. Spencer Roberts presented a case of multiple fracture of the hand by a detonator explosion, and Dr. J. H. B. Henderson read reports on interesting cases of cerebral œdema and the allergic symptoms of tick-bite.

Dr. Howard Saxby presented notes on methods of skin preparation and hand sterilization, and urged the

BRITISH MEDICAL ASSOCIATION (VICTORIAN BRANCH)

Statement of Receipts and Payments for Period from January 15, 1932, to January 10, 1933.

RECEIPTS.	£ s. d.	£ s. d.
January 15, 1932—		
To Balance, National Bank of Australasia, Limited	794 16 10	
„ Cash in hand	16 0 0	
		810 16 10
January 10, 1933—		
To Subscriptions—		
Metropolitan Members	3,541 3 4	
Country Members	1,652 3 0	
Junior Members	322 10 0	
		5,515 16 4
„ Duplicating Department		53 0 4
„ List of Members		0 7 0
„ Sale of Catalogues		0 10 6
		£6,380 11 0

PAYMENTS.	£ s. d.	£ s. d.
January 10, 1933—		
By Medical Society of Victoria		2,616 6 6
„ *The British Medical Journal*		1,658 12 6
„ Rebates to Subdivisions		48 12 6
„ Salaries—		
Secretary	800 0 0	
Library Assistant	182 0 0	
Assistant Typiste	117 10 10	
		1,099 10 10
„ Postages, Duty Stamps, etc.		127 8 6
„ Printing		37 15 2
„ Stationery		83 10 9
„ Commission		19 15 10
„ Advertising		11 0 0
„ Audit Fee		5 5 0
„ Telephone		10 3 9
„ Legal Expenses		4 4 0
„ Bank Charges *et cetera*		3 0 9
„ Electric Light and Power		5 8 11
„ Federal Committee Expenses		69 10 3
„ Lanternists		4 0 0
„ Lodge Slips		2 19 6
„ Sundries		34 17 10
„ Balance, National Bank of Australasia, Limited	526 8 5	
„ Cash in Hand	12 0 0	
		538 8 5
		£6,380 11 0

Compared with the Books and Accounts of the British Medical Association (Victorian Branch) and found to be in accordance therewith.

C. STANTON CROUCH, Secretary.
C. H. MOLLISON, Honorary Treasurer.

J. V. M. WOOD & Co.,
Chartered Accountants (Aust.).

Melbourne,
January 31, 1933.

MEDICAL SOCIETY OF VICTORIA.

Statement of Receipts and Payments for Period from January 15, 1932, to January 10, 1933.

RECEIPTS.	£ s. d.	£ s. d.
January 10, 1933—		
To Transfer from British Medical Association, Victorian Branch	2,616 6 6	
„ Balance, National Bank of Australasia, Limited	164 14 7	
		£2,781 1 1

PAYMENTS.	£ s. d.	£ s. d.
January 15, 1932—		
By Balance, National Bank of Australasia, Limited		342 9 4
January 10, 1933—		
By THE MEDICAL JOURNAL OF AUSTRALIA		1,583 7 6
„ Interest on Building Fund Debentures		421 15 0
„ Salaries—		
Library Clerk	72 0 0	
Caretaker	100 0 0	
		172 0 0
„ Library, Journals and Binding		156 1 7
„ Dr. Cox Testimonial		5 6 0
„ Rates, Taxes and Insurance		25 12 6
„ Light and Power		5 8 11
„ Audit Fees		5 5 0
„ Telephone		10 3 9
„ Social Meetings		20 0 0
„ Bank Charges		1 2 6
„ Repairs		18 12 6
„ Sundries		13 16 6
		£2,781 1 1

Compared with the Books and Accounts of the Medical Society of Victoria and found to be in accordance therewith.

C. STANTON CROUCH, Secretary.
C. H. MOLLISON, Honorary Treasurer.

J. V. M. WOOD & Co.,
Chartered Accountants (Aust.).

Melbourne,
January 31, 1933.

advantages of a mixture of crystal violet and brilliant green.

Dr. A. J. Kennedy made a plea for the earlier investigation of simple urological symptoms. He demonstrated four cases: (i) renal tuberculosis, (ii) renal calculus, (iii) new growth of the bladder, and (iv) new growth of the prostate, in which the cardinal symptom was frequency of micturition, and in which the diagnosis was missed on account of insufficient investigation. He also reported a case of hydronephrosis with multiple calculi in the other kidney in a woman five months pregnant. His last case was one of albuminuria and hæmaturia associated with focal sepsis. The symptoms abated completely and rapidly after a radical mastoid operation.

In the evening a dinner was held at the Royal Hotel, and afterwards Dr. E. S. Meyers gave an interesting account of his cases at the Brisbane General Hospital, and Dr. Kenneth Wilson presented an enlightening paper on "Dry Labour".

Dr. F. J. Short and Dr. Howard Saxby were elected President and Honorary Secretary respectively of the new association.

Medical Societies.

PUBLIC MEDICAL OFFICERS' ASSOCIATION OF NEW SOUTH WALES.

THE SEVENTH ANNUAL GENERAL MEETING OF THE PUBLIC MEDICAL OFFICERS' ASSOCIATION OF NEW SOUTH WALES was held in the B.M.A. Building, Macquarie Street, Sydney, on January 24, 1933, PROFESSOR HARVEY SUTTON, the President, in the chair. Twenty-one members were present and twelve sent proxies.

Financial Statement.

The Honorary Terasurer, Dr. E. L. Morgan, submitted the financial statement for the year 1932, which showed receipts totalling £54 19s. 2d. and an expenditure of £25 9s. 3d. There was a credit balance of £378 6s. 8d.

Annual Report.

The Honorary Secretary presented the annual report for the past year. The report is as follows.

1. The continuance of the industrial depression in New South Wales during 1932 has obliged the Committee to continue its defensive policy of the prveious year. There are indications, however of the approach of a brighter era, and it is hoped that the Association will be able to again adopt a progressive policy in the near future.

2. Ten Committee meetings were held during the year, the attendances of group representatives being as follows: Professor Harvey Sutton (President), 9; Dr. C. Badham, 4; Dr. M. R. Finlayson, 7; Dr. S. Evan Jones, 6; Dr. A. E. Machin, 7; Dr. Dorothy McClemens, 4; Dr. R. J. Millard, 4; Dr. E. L. Morgan, 9; Dr. H. H. Nowland, 5; Dr. H. Hastings Willis (Secretary), 10.

3. The number of members on the roll of the Association is now 82, the extension of membership to part-time medical officers not having appreciably increased our numbers. It is with much regret that the death is recorded of Dr. F. M. Suckling, Assistant Medical Officer of Health, New South Wales Health Department. His genial personality will remain a happy memory to his colleagues.

The difficulties of the present times, which many consider a critical period for the Public Services, make it necessary that the Committee's activities should be supported by the individual efforts of a large number of enthusiastic members.

4. During the year concerted action with public medical officers in other States has been desirable in several matters, and it is a cause for sincere regret that active Public Medical Officers' Associations have not yet been organized throughout Australia.

5. Our relations with service and professional organizations remain cordial and unchanged. In July the Committee met the New South Wales Minister for Health and placed before him our viewpoint on several matters of public policy. Representations were made to the Federal Minister for Health against certain proposed retrenchments in the Federal Health Services and a satisfactory reply was received.

6. Five circular letters have been distributed to members during the year.

7. It gave the Committee much pleasure to be able to arrange for members to meet Sir F. N. Kay Menzies, Medical Officer of Health, London County Council, during his recent visit to Sydney. Twenty members were present at morning tea at the School of Public Health on June 17, 1932, and heard with interest Sir Frederick's account of recent changes in the organization of the Health Services of Greater London.

8. The annual social function of the Association was a dinner at the University Union on the evening of August 23, 1932, when we entertained public medical officers from other States visiting Sydney for the meeting of the Australian Association for the Advancement of Science.

9. The Committee has continued to interest itself in schemes to provide better facilities for post-graduate study in Sydney, and supported certain proposals of the School of Public Health and Tropical Medicine, which unfortunately have not yet materialized. It is much to be regretted that in some cases heads of departments have not afforded facilities for our members to take advantage of the courses at present available.

10. The salaries of our members in the Federal services were reduced following a fall in the "declared cost of living", and those serving the New South Wales Government suffered an appreciable reduction consequent on a fall in the New South Wales basic wage.

The Association's agreement with the New South Wales Public Service Board expires on June 30 next, and the negotiation of a new agreement will be an important duty of the incoming committee.

11. Following upon the refusal of the annual meeting of 1932 to approve of the necessary alterations in the rules of the Association, the Committee has been obliged to abandon the proposal to register the Association as a trade union under the New South Wales State law.

12. The financial statement for the year is appended. The reduction of the annual subscription to five shillings has greatly decreased our income, and has, as was expected, increased the difficulty of collecting it.

HARVEY SUTTON,
President, 1932.

Election of Office-Bearers.

The following officers were elected for the year 1933.

President: Dr. R. J. Millard, C.M.G.
Honorary Auditor: Dr. Elsie J. Dalyell.
Honorary Secretary: Dr. H. Hastings Willis.
Committee: Dr. Chas. Badham, Dr. E. L. Morgan and Dr. C. E. Percy (New South Wales Health Department), Dr. S. Evan Jones and Dr. H. H. Nowland (Mental Hospitals), Dr. Dorothy McClemens and Dr. W. K. W. E. Flook (Education Department), Dr. M. R. Finlayson (Works and Railways), and Dr. H. H. Willis (Repatriation Department).

Discussion.

A discussion took place on the hospitals problem in New South Wales, which ended in a resolution that the Committee should bring the views of members before the Council of the New South Wales Branch of the British Medical Association.

The meeting terminated with a hearty vote of thanks to Professor Harvey Sutton for his services as President during the past year.

THE MEDICAL DEFENCE SOCIETY OF QUEENSLAND.

THE ANNUAL MEETING OF THE MEDICAL DEFENCE SOCIETY OF QUEENSLAND was held at the B.M.A. Building, 35, Adelaide Street, Brisbane, on January 19, 1933, DR. A. H. MARKS, the President, in the chair.

A motion of condolence was carried to the family of the late Dr. Wilton Love, whose death had taken place on January 4, 1933. Dr. Love had been a member of the Council for many years. It was resolved that a letter of sympathy be sent to his family.

Annual Report of the Council.

The annual report of the Council for the year ended December 31, 1932, was presented and adopted on the motion of the President, seconded by Dr. A. C. F. Halford. The report is as follows.

The following annual report of the Society is submitted by the Council for the year ended December 31, 1932.

Membership.

The membership of the Society is now 387. During the year 22 new members were elected. Our losses have been as follows: Four left the State, 10 have defaulted in payment of subscriptions for two years, and one deceased. This makes a total gain of seven members.

The Council regrets to record the death of Dr. H. C. Garde, of Maryborough, who for many years was a member of the Society.

Office-Bearers and Council Elected for 1932.

President: Dr. A. H. Marks.
Vice-President: Dr. D. A. Cameron.
Honorary Secretary: Dr. Neville G. Sutton.
Honorary Treasurer: Dr. R. G. Quinn.
Councillors: Dr. A. G. Anderson, Dr. A. B. Carvosso, Dr. Wilton Love, Dr. S. F. McDonald, Dr. W. N. Robertson, Dr. Kerr Scott, Dr. H. S. Waters.

Medico-Legal.

Five cases were submitted to the Council during the year, three of which were referred to the Society's solicitors. One case occurred prior to the election of a member and could therefore not be taken up by the Society.

So far, no further action has been taken by the claimants in any of the cases taken up by the Society.

Assets.

The total assets of the Society amount to £3,583 17s. 11d., of which £2,882 3s. 6d. is invested in Australian Treasury bonds and £200 in Australian consolidated stock. Surplus of income over expenditure amounted to £299 7s. 11d., the expenses totalling £66 7s. 10d., which includes £25 2s. 3d. Federal income tax. Entrance fees amounted to £23 2s., and subscriptions, including one life membership of £10 10s., to £206 14s. The total amount of income from investments was £133 5s. 3d.

ALEX. MARKS,
President.
NEVILLE G. SUTTON,
Honorary Secretary.

Financial Statements.

The financial statement and balance sheet were presented, their adoption being moved by Dr. A. G. Anderson and seconded by Dr. Kerr Scott.

Election of Office-Bearers.

Dr. Alex. Marks, Dr. W. N. Robertson and Dr. A. B. Carvosso were unanimously reelected, and Dr. G. W. Macartney was unanimously elected a member of the Council for the ensuing year, in place of the late Dr. Wilton Love.

Mr. R. G. Groom, Chartered Accountant (Aust.), was elected auditor.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on February 6, 1933.

The degrees of Bachelor of Medicine (M.B.) and Bachelor of Surgery (B.S.) were conferred *in absentia* upon Geoffrey Charles Hogg and Clive Herbert Selby.

The Diploma in Public Health was awarded to John Grahame Drew, M.B., Ch.B. (London), Talbot Lewis Dunn, M.B., B.S. (Adelaide), Edward Charles Egan, M.B., Ch.M. (Sydney), and Otto Waldemar Mater, M.B., Ch.M. (Sydney).

The following resolution was adopted by the Senate in connexion with the death of Professor John Le Gay Brereton:

> The Senate records with extreme regret and sense of irreparable loss the death, on February 2nd last, of Professor John Le Gay Brereton, who had occupied the Chair of English Literature since its foundation in 1921, after having been Librarian since 1902. In more than thirty years of unselfish and dutiful service to the University he became eminent as a scholar, wherever English literature was studied, through his researches in the Elizabethan drama and his critical mastery of its substance, as by precept and example, he established his subject in the affection of its students and helped many of them to qualify for good work in scholarship and literary teaching. He also attained distinction as an Australian poet and man of letters, whose rare gift of mind and spirit, joined to a beautiful simplicity of nature and kindliness of understanding, raised the literary character in public esteem and won for the University and for learning itself an increase of public comprehension and friendliness.

A letter was received from Sir Percy Nunn, of the Institute of Education (London), drawing attention to the establishment by the Rhodes Trust of two scholarships of £200 each, one to be allotted to an Australian graduate holding a teaching diploma or a higher degree in education, and tenable at the London Institute of Education.

The appointment of Dr. R. B. Wade (in the room of the late Sir Charles Clubbe) as the representative of the Royal Alexandra Hospital for Children on the Conjoint Board was approved.

The following appointments were approved: Mr. W. E. H. Stanner, B.A., as Temporary Lecturer in Anthropology; Dr. J. E. Mills, M.Sc., as Assistant Lecturer in Chemistry; Mr. R. P. Gilder as House Surgeon, Department of Veterinary Science.

The ceremony of matriculation was fixed for Thursday, 30th March, 1933.

The ceremony of conferring of degrees was fixed for Saturday, May 6, 1933, for graduands in the Faculty of Arts, and Saturday, May 13, 1933, for graduands in all other faculties.

Correspondence.

EXOPHTHALMOS.

SIR: Reading with interest your subleader on "Exophthalmos" in the December 31, 1932, issue of your journal, I would like to refer to an article read by me at the Medical Congress held in 1924, and published in the supplement of this journal on March 1, 1924.

That some cases of thyreo-toxic goitre are associated with exophthalmos and others are not requires explanation. I have lately had five patients with extreme exophthalmos, two of whom had practically no thyreo-toxic symptoms. As they all had the same exciting cause, the presentation of one case will explain the whole.

Miss E.M., *ætatis* thirty-seven years, was operated on for exophthalmic goitre thirteen years ago. Her general thyreo-toxic symptoms were improved, but not her exophthalmos. For the last seven years she has been unable to close her eyes owing to the extreme degree of protrusion. This resulted in a constant state of inflammation of them. She also had diplopia. She had severe and persistent headaches and on careful questioning it was found that there was a good

deal of yellow post-nasal discharge. Within a week of putting her on treatment for her infected sinuses, the headaches ceased, the diplopia vanished and the eyes began to recede. The eyes have receded steadily and within three months have almost returned to normal. In proportion to the amount of improvement of the sinusitis, so will the exophthalmos improve.

Lesion or irritation of the superior cervical ganglion will affect motor and secretory cells in the muscle of Müller, the thyreoid and the heart; lesion of the median ganglion will affect the thyreoid and the heart; lesion of the inferior will affect the heart alone.

Evidence of direct infection of the cervical ganglia has occasionally been found *post mortem*.

Pottenger showed how in phthisis afferent nocuous impulses passing from the lung to the cervical portion of the cord set up irritation in the neighbouring nerve cells; the efferent impulses from these resulted in increased tone of muscles, wasting and atrophy of tissues. The same mechanism must be applied where infected sinuses are concerned, causing increased tone of Müller's muscle and with the added irritation of the superior cervical ganglia from this source, tachycardia with increased thyreoid output would result. So cervical ganglia irritation is possible from a direct as well as an indirect source. In cases showing marked exophthalmos, particularly where one eye is more prominent than the other, sinus infection is almost sure to be found. Again with tonsillar infection the indirect irritation of the cervical ganglia is probably responsible. We must at the same time realize that the irritation of the general sympathetic nervous system may be so pronounced as to produce some exophthalmos in infections remote from any possibility of irritating the cervical ganglia, but under such conditions we are far more likely to find thyreo-toxic goitre without marked exophthalmos. This does not explain the deposit of orbital pad of fat which is usually found in such cases.

Since then I have had a good many similar cases and all have lost their exophthalmos when antral or other sinuses have been cleared up. I am quite prepared to admit a certain amount of exophthalmos with infections elsewhere than in the sinuses, but in severe cases have always found it there. I have on other occasions drawn attention to the fact that in looking for infections in goitre, the sinuses are often overlooked. It would be interesting to hear if others with cases of exophthalmos have had the same experience as myself.

Yours, etc.,

SYDNEY PERN.

12, Collins Street,
Melbourne,
January 16, 1933.

DIATHERMY OF TONSILS.

SIR: Renewing the diathermy controversy. To reopen a hackneyed subject, which has remained in abeyance for a short while, I am bringing forward some aspects of diathermy of tonsils as they appeal to me.

An immense amount has been written in the last eighteen months on this treatment, and the controversial nature of the various writers must in itself cast doubt on the method; again most of those writing in favour are not ear, nose and throat specialists; the latter as a whole are against it, and they surely must be the ultimate judges.

All ear, nose and throat surgeons are agreed that diathermy has its uses, but very few regard it as the best possible way of removing tonsils.

Unfortunately, the rush of favour diathermy has enjoyed amongst those outside the specialty has created in the public mind an idea that diathermy has replaced operative removal and that all they have to do is to attend a few times and have their tonsils spirited away with almost no discomfort. This idea will be dissipated eventually when more and more people have recurring attacks of tonsillitis after diathermy and have no relief from the general symptoms they may be suffering from and are told later that they still have tonsillar tissue left.

It is quite a common thing to see patients who say they had several treatments and were assured that their tonsils were destroyed, and on examination to find large remains. The assurance of complete removal was honestly given, but enough time was not allowed to elapse. To my mind it is almost impossible to say a tonsil is destroyed without waiting several months after cessation of treatment.

Some writers have tried to justify themselves by saying that the remains do not matter or can be dealt with as the occasion arises; this is entirely contrary to the recognized opinion of many years, that remains are usually worse than whole tonsils. Drs. Graham Brown and J. V. Duhig's recent article published in THE MEDICAL JOURNAL OF AUSTRALIA, July 2, 1932, has shown that diathermy remains are no exception to this rule.

Diathermy advocates claim that the method is relatively painless and allows the patients to carry on with their occupation. In my small experience the former is definitely untrue. The operation is painful while being done and leaves a very sore throat for a considerable time after it. This happens on numerous occasions and it is doubtful if many can be fully efficient while their throats are sore or at least uncomfortable. A personal friend of mine had very septic tonsils diathermied, but after three treatments gave it up because of the acute pain during and after operation.

In conclusion, I maintain that the weight of opinion of those most qualified to judge is against diathermy of tonsils as a usual practice and that harm is being done when patients are assured that it is the best method.

Yours, etc.,

R. H. BETTINGTON.

185, Macquarie Street,
Sydney,
January 18, 1933.

TRAVELLING FEES CHARGED BY MEDICAL PRACTITIONERS.

SIR: The copy of the letter from the Secretary of the Graziers' Association, published in the journal, is of particular interest to me, as I practise in a grazing district, and a considerable proportion of my practice is amongst graziers and their families.

I intend to comment on only one aspect of the question.

The "environment accorded during years of prosperity", of which Mr. Allen speaks, seemed to demand that the graziers should take themselves and their families to expensive specialists for treatment on all possible occasions. As one man said to me: "I can afford specialists. If there is anything in specialists I intend to have one."

On that occasion, I managed to persuade him that the matter was really urgent, and I was permitted to remove a gangrenous appendix from his wife, then seven months pregnant. In spite of the fact that I went to the trouble and expense of serving a considerable time as resident medical officer at various teaching hospitals, in order to be able to serve these people adequately, I was merely used as a convenience. I was allowed to do the work and possibly save a few lives when there was something urgent and difficult to attend to, such as an acute appendix, a bleeding ectopic, or a ruptured gastric ulcer. I was called in if the severe bleeding of a *placenta prævia* caught the patient unawares a few weeks before she went to Sydney for her confinement.

In those days they would pay their thirty or forty guineas confinement fee, with other proportionately extravagant expenses, instead of getting equally expert attention here for five guineas. Now they stay here, and in many cases are unable to pay even our moderate fees.

To quote two examples only.

(1) My fees for appendicectomy, confinement, a few consultations, and visits amounting to about 120 miles, were £45. Most of the above work was done over two years ago, but a third of the fee is still unpaid.

(2) Confinement by a fifty guinea specialist nearly three years ago. I did the prematernity work, and a good deal since, the fees amounting to thirteen and a half guineas. The account has been sent sixteen times, but so far without result.

In other words, their medical expenses are reduced to one-third or one-half of what they were a few years ago, because they now come to us instead of going to Sydney, in spite of which we are worse off because of the increase in bad debts.

Why should we be used still further as a convenience by being asked to reduce our fees? For obvious reasons I ask permission to subscribe myself.

Yours, etc.,

G.P.

January 20, 1933.

AN ECONOMIC COMMENTARY AND DIAGNOSIS.

SIR: In Australia during the last four years the working class has undergone increased unemployment and decreased wages. The small trader and the farmer have met decreased trade and prices. As these together form the majority of the people, the medical profession is naturally meeting the same troubles.

There have just been three good seasons in Australia. Last year, although 400,000 were unemployed, the actual volume of primary commodities produced was larger than ever. Australia produced five times more wheat than was required for local consumption and sixteen times more wool. A similar excess occurred in meat, butter, coal, sugar *et cetera*. There is £128,000,000 of factory machinery in Australia. The people are literate. Skilled workers are in abundance.

How does the profession regard our political economy? Your recent correspondents suggest: (*a*) That abuse of public hospitals is the trouble. (*b*) That science should investigate. (*c*) That a new monetary system should be instituted. (*d*) That the profession should be limited in number. (*e*) Faint murmurs from a single taxer.

In answer to (*a*), poverty, not disinclination to pay, is the reason people enter public hospitals. Suggestions of Dr. Woodburn belong to 1830, not 1933. I advise him to study the history of English poor law. To (*b*), Marx and Lenin have made the scientific investigation and fully ascertained the causes and remedies. To (*c*), Karl Marx pointed out in 1850 that monetary reformers inevitably found themselves adding land nationalization and regulation of production to their schemes, that is, they inevitably would need a revolution to carry them out. To (*d*), this proposition, like the rationalization of production is confronted by a falling demand and would fail. To (*e*), single taxers are referred also to Marx. Their suggestion would lessen the restraint on the capitalist system, narrow the number of the possessing class and further impoverish the profession.

Our profession, supposedly scientific, should give earnest study to the scientific political economy upon which Soviet Russia is based, the country in which today there is more expenditure on, and cultivation of, science than in any country in the world. This study will require time and effort, and will, as usual, disclose that appearances are deceptive and superficial remedies useless.

Yours, etc.,

G. P. O'DAY, M.D.

245, Latrobe Street,
Melbourne,
January 21, 1933.

THE INSANITARY WATER CLOSET.

SIR: With the advent of flats and the concentration of human beings into large buildings conditions of living have altered in the last twenty years. Advances in architecture, engineering, and other sciences have enabled man to live in close congregation and yet in a degree of safety and comfort that would have been deemed impossible fifty years ago. Efficient water supply and sewerage under the guidance and advice of public health authorities have been the greatest factors in this change probably, and the health of the community has been safeguarded.

Occasionally, however, faults have crept in or difficulties have not been overcome. This may be demonstrated by so simple an example as the ordinary water closet pedestal pan, now an indoor feature of every flat and most private houses. Our feelings of cleanliness are appeased by the sight and sound of rushing waters, but not so our sense of smell, which may be offended. The cause is not far to seek for the inquiring mind. With a pledget of cotton wool on a curved uterine forceps it is possible to reach under the lip of the rim of the pedestal pan. The discoloration and deep staining of the wool give visible proof that what is apparently of snow white purity has hidden depths of grievous tarnishing. That this should occur despite the quantity of water passing is surprising, but is probably due to film formation in the first instance with misuse, or rather, lack of use, of the mechanical flush. Being out of sight, many individuals who are otherwise punctilious in matters of cleanliness refuse to believe that there is any possibility of unseen contamination, and all the more so when the visible portions are kept spotless. Indeed, resentment may be shown, just as when other household arts are criticized, such as cooking. Those in charge, both in public and private hospitals, may not be free from this weakness. As far as danger of infection goes, probably the amount of water used reduces this to a minimum, though one health authority has pointed out the possibility of flies being contaminated and then reaching food that is exposed, such as the luncheons of school children.

Another authority, in referring to water closets in residences, has gone so far as to speak in condemnation of their presence there altogether. This can hardly be carried out now, though the architect of the future may place them in the attic or the basement. In the meantime the design of sanitary ware should be closely watched. One popular type, of good appearance, has a strengthening ridge projecting on the inner side. This no doubt aids the swirl of water, but narrows access from below for cleansing.

Yours, etc.,

"SALUS."

January 21, 1933.

THE FUTURE OF MEDICINE AS A PROFESSION.

SIR: *Re* "The Future of Medicine as a Profession". In the first place, the writer of the original article under this title set out to show that the ratio of medical men to population was diminishing to a figure at which the existing members of the profession would find it hard to live, and aspirants to the profession, if encouraged, would further reduce this ratio and find it harder to live. Figures may prove this to be a cold fact, but the future of medicine is not bound up in a consideration of whether there is a living to be obtained or not. Competition is a healthy atmosphere for any profession or calling, it tends to keep the members up to the mark and the public is ready to select the best regardless of the many. In medicine we find some of our colleagues have many demand their services, whilst some others relatively few.

It is nobody's function to prevent anyone from exploring the fields of medicine; perhaps some of our future most brilliant men may thus be debarred from their designed calling; or is it right that those at present in the profession should make it any harder for those who wish to enter. Medicine should never be linked up with any coterie or conservative class, or be shackled as a plumbers' union to so many apprentices a year. Those who have the inborn qualities to qualify for so arduous a life will win through and those who have not will cease to persist if the reasonable standard of knowledge required is upheld.

In the second place, the future of medicine is bound up with the inertia of the profession as a whole; and an inertia that is born into the profession by its many successful members. It is a difficult matter to deal with;

what one means by inertia is the failure of the profession as a whole to assert itself.

We have an association that is a fine spirit of union; an association, the conception and ideals of which we are all proud. Its organization is excellent, but in reality it stands as a sphinx, the silent reminder of the noble works of the past, a mass of inertia, at least to those without, and a ponderous weight to those within.

Surely today we are suffering in a pecuniary sense and in prestige from the failure of our association to assert itself. The medical profession is an all important section of the community, yet recently it has suffered the ignominy of being flouted. The best of men, men we have all looked up to, men who have served the State and the public well, men who have, I believe, set themselves out to perform their duties in a selfless manner, are relegated to the scrapheap in a cursory manner; again we have seen the appointment of a layman as Hospital Commissioner, also the *Hospitals Act* is about to be recast, and the taunt from the Minister for Health (who should be a doctor) that the British Medical Association was asked for advice, without response; but has the profession, through the Council, said anything?

The future of medicine is in the balance, the accepted foundations begin to rock, the medical profession must assert itself now. There is too much finesse and not enough action, too much fear and not enough boldness. The time has come when our relationship to the public must be adjusted to the mutual advantage of both. A profession which has served the public so well night and day, has but to point the way and the public will follow.

The medical garden needs a real clean up, the weeds are all round—baby clinics, laymen in medical public offices, layman Minister for Health, charlatans, prescribing chemists, abortionists and the pay-you-next-Friday patient, a most demoralising and increasing weed; in fact, the very future of the garden is at stake and it is likely to be turned into a common, with the tendency today of the prostitution of knowledge, or else struggle for existence, strangled by these weeds of interference. In such a condition of affairs in a garden, one would ask, what is the gardener doing? What is the profession doing in the garden of medicine?

Yours, etc.,

H. R. SCRIVENER.

Undated.

ANÆSTHESIA FROM THE GENERAL PRACTITIONER'S POINT OF VIEW.

SIR: "General Practitioner's" pertinent letter seems to call for discussion under three headings, namely, (*a*) the safety of ether in the hands of partially-trained anæsthetists; (*b*) the safety of ethylene or other gaseous anæsthetics, in both trained and untrained hands; (*c*) the claim of ethylene to special safety, in view of the fatalities known to have occurred during its administration.

(*a*) *The Safety of Ether.*—The writer believes ether to be, beyond all cavil, the anæsthetic most suited to the general practitioner anæsthetist. Whatever advantages may accrue from the use of the gaseous anæsthetics, these last are only safe in trained and expert hands. Ether is easy of administration, and in most instances calls for no intricate apparatus. Its cost is trivial. Although not free from toxic action upon the heart, liver and kidneys, it is much less toxic to these organs than is any other of the non-gaseous anæsthetics. The margin between the anæsthetic and depressant doses is wide, and respiratory failure (with its greater prospect of resuscitation) almost invariably precedes circulatory arrest in the normal subject. For any anæsthetist not thoroughly trained in gas anæsthesia, ether is certainly the safest anæsthetic.

(*b*) *The Safety of Gaseous Anæsthetics.*—Within limits, all the gaseous anæsthetics (ethylene, nitrous oxide, acetylene and cyclopropane) have a common manner of action, common advantages and common dangers. All are "physical" anæsthetics, apparently acting by alteration in the oxygen concentration of the tissue cells and not by chemical combination with the tissues. Hence, all are relatively rapid in anæsthetic action and in elimination, and all are free from toxicity to the heart, liver and kidneys, as well as being non-irritating to the lungs. Their manner of action, however, implies that all present a relatively narrow zone of anæsthesia, merging into inadequate narcosis on the one hand and undue deprivation of oxygen (anoxæmia) on the other. It is the maintenance of anæsthesia within this narrow zone which constitutes the difficulty in the administration of the gaseous anæsthetics. The unskilled administrator tends to approach too nearly the frontier of anoxæmia, and it is obvious that prolonged anoxæmia will lead to the rapid failure of even a sound cardiac and respiratory mechanism. A mechanism debilitated by age or disease will succumb all the sooner. It follows, therefore, that, to be in any way safe, gaseous anæsthetics must be administered by an anæsthetist who is master of the technique. In unskilled hands no anæsthetics are more dangerous.

It may be asked whether gaseous anæsthetics, properly administered, are really safer than well-given ether. A true answer could only be obtained by the classification of a large number of patients into groups in terms of the operative and anæsthetic risk. The "A" risk to "D" risk classification of the International Anesthesia Research Society, familiar to anæsthetists, would serve admirably. A stated operation, for example, appendicectomy, should then be considered, performed upon groups of patients of different degrees of risk, but under the same anæsthetic. The same operation, in similar groups of patients, would then require to be performed under other anæsthetics. In this way a true comparison of the different anæsthetics could be obtained. No such paper has as yet appeared, so far as the present writer is aware. The anæsthetic department of the public hospital in which he works is about to review its data for the year 1932, classified in this way, and this information will be at "General Practitioner's" disposal when complete.

Although the writer cannot direct "General Practitioner" to published work conclusively demonstrating the advantages of gas anæsthesia, he would suggest that he consult any surgeon who was engaged in military surgery in the war years. Gas anæsthesia obtained general vogue in British communities at that time, and its superiority to other forms of anæsthesia for badly shocked and injured men has been frequently remarked to the writer by former army surgeons. Finally, "General Practitioner" should consult surgeons and anæsthetists habitually using gaseous anæsthetics in their public hospital practice. He will be told that they adhere to gaseous anæsthetics, for poor risk cases especially, because those anæsthetics involve less depression upon the operating table and a readier recovery from the effects of the anæsthetic. Such an opinion has not the force of well-controlled statistics, but it is widely diffused through many lands and advanced in no uncritical spirit, so that it merits consideration. Gaseous anæsthetics, with their expense, their intricate apparatus and their minor difficulties for the surgeon, which ether does not give, have won their way in face of some opposition. At the moment, until the statistics desired by "General Practitioner" be forthcoming, it can only be said that gaseous anæsthetics would not have won their way had they not had special advantages to give.

(*c*) *The Safety of Ethylene.*—It is a matter of debate amongst gas anæsthetists as to whether ethylene is really safer than other gaseous anæsthetics. Nitrous oxide, for instance, has its firm advocates. Be this as it may, ethylene is easier to administer than is nitrous oxide, and for this reason may be safer in partially trained hands. The zone between consciousness and anoxæmia is somewhat wider than with nitrous oxide, allowing a greater margin of error. In this sense the present writer is inclined to accept Dr. Lidwill's statement as to the safety of ethylene, but with the added and fundamental proviso that the administration be in competent hands.

The writer is aware of many or most of the ethylene fatalities in Melbourne to which "General Practitioner" refers, having incorporated them in two articles in this journal. That they were not always listed as anæsthetic deaths is because they were often due rather to surgical conditions or grave disease than to anæsthesia. For this reason they were not always the subject of a coroner's

inquest. The writer will be glad to place at "General Practitioner's" disposal the details of such fatalities under gaseous and non-gaseous anæsthetics as he has analysed.

An uncritical statement that numerous deaths have occurred under ethylene is scarcely helpful. The writer, however, having investigated a number of such deaths, is in a position to state that in every case the patient was of grave anæsthetic risk. No gas anæsthetic fatality in Melbourne, in a patient of good anæsthetic risk, is known to the writer. The same could not be said of ether, though in justice it must be admitted that gas anæsthesia is usually selected nowadays for cases of grave anæsthetic risk, and is generally administered by, or under the supervision of, anæsthetists familiar with the gas anæsthetic technique.

Yours, etc.,

14, Collins Street, Melbourne, C.1.
January 21, 1933.

GEOFFREY KAYE.

Obituary.

GEORGE CUSCADEN.

WE regret to announce the death of Sir George Cuscaden, which occurred on February 6, 1933, at South Yarra, Victoria.

HILDA MABEL RENNIE.

WE regret to announce the death of Dr. Hilda Mabel Rennie, which occurred on February 6, 1933, at Forest Hill, Victoria.

Post-Graduate Work.

LABORATORY INSTRUCTION AT SYDNEY.

SPECIAL facilities for post-graduate work are offered by the School of Public Health and Tropical Medicine, University of Sydney. During the course of instruction for the Diploma in Tropical Medicine a series of intensive courses are held in the subjects of the diploma: bacteriology and pathology, protozoology, helminthology and entomology. These courses consist of lectures and laboratory work of about three hours' duration every day for three weeks (except bacteriology and pathology, five weeks). A limited number of places are available for medical graduates on application to the Director of the School. No fees are required, but some small charges for breakages, hire of microscope *et cetera* are made.

The time-table of these courses is as follows:

Bacteriology (five weeks): Mornings, February 13 to March 20.
Pathology (two weeks): Afternoons, February 13 to February 24.
Helminthology (three weeks): Afternoons, February 27 to March 20.
Protozoology (three weeks): Mornings, March 21 to April 12. (This course is repeated in the afternoons.)
Entomology (three weeks): Afternoons, April 19 to May 12.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenencies* sought, etc., see "Advertiser," page xviii.

BRISBANE MATER CHILDREN'S HOSPITAL, QUEENSLAND: House Physician, House Surgeon.

NEWCASTLE HOSPITAL, NEWCASTLE, NEW SOUTH WALES: Junior Resident Medical Officer.

THE RACHEL FORSTER HOSPITAL FOR WOMEN AND CHILDREN, SYDNEY, NEW SOUTH WALES: Honorary Assistant Surgeons (female).

THE WOMEN'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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